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A TREATISE

ON

GYNÆCOLOGY,

CLINICAL AND OPERATIVE.

BY

S. POZZI, M.D.,

PROFESSOR IN THE FACULTY OF MEDICINE (PARIS); SURGEON TO THE LOURCINE-PASCAL HOSPITAL.

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TREATISE ON GYNÆCOLOGY,

CLINICAL AND OPERATIVE.

BOOK V.

CANCER OF THE UTERUS.

THE word *cancer* ought really to have an essentially clinical signification and to be synonymous with *malignant new growth*. Malignancy, characterised by incontrollable invasion, recurrence after removal, and general infection, is met with in the case of several kinds of growth that are anatomically distinct, and the profound study of which is of more interest to the morbid anatomist than to the surgeon; nevertheless, this study furnishes some useful considerations from a prognostic point of view, and an attempt should always be made to determine the histological characters of the growths in the living subject, though in spite of the hopes some writers have entertained no sensibly different indications of treatment can be based thereupon.

The cervix and the body of the uterus may each be invaded to the exclusion of the other.

I shall first consider cancer of the cervix.

CHAPTER I.

PATHOLOGICAL ANATOMY, SYMPTOMS, DIAGNOSIS, AND ÆTIOLOGY OF CANCER OF THE CERVIX.

Pathological anatomy. Histogenesis. Anatomical forms. Histological varieties. Extension to neighbouring parts: vagina; body of the uterus; connective tissue of the pelvis; urinary apparatus. Secondary lesions of the heart. Extension to the rectum, to the peritoneum. Glands. Infection of glands above the clavicle. Liver.—Symptoms. Commencement. Latent period. Period of declaration. Cachexia. Terminations.—Complication with pregnancy.—Diagnosis from: metritis, papilloma, mucous polypus, ulcerated fibrous polypus.—Exceptional forms: hypertrophy and cancer. *Sarcoma hydropicum papillare.* Strio-cellular myo-sarcoma. Adeno-myxo-sarcoma. *Fibroma papillare cartilaginescens. Myoxoma enchondromatodes arborescens. Adenomyxoma.*—Diagnosis of spreading.—Prognosis.—Ætiology.

Pathological anatomy.—The great predisposition of the cervix uteri to malignant new growths has struck all observers. Is

there any fact in its general structure that can explain this liability? Cohnheim put forward the hypothesis that the embryonic cells (Robin's embryoplastic cells) which have not disappeared during the formation of organs, and which may be found either disseminated through the connective tissue or accumulated in islands at certain places, are the mother-tissue of the carcinomata. The seat of predilection of these embryonic cells would be precisely at the natural orifices, where there occurs a more or less irregular involution of the layers of the blastoderm; the cervix uteri developed relatively late at the expense of Müller's ducts would enter into this category of regions congenitally vulnerable. Further, there must be noted at the external os the presence of two kinds of epithelium and the tendency to plastic polymorphism that may result therefrom.

The efficient cause of the new growth, however, even then remains unknown; the repeated afflux of blood to which Cohnheim attributed so much importance is not a sufficient explanation.

In *epithelioma* of the mucous membrane it is evident that the heterologous growth comes from the epithelial cells, either of the Malpighian layer (Klebs), or of the intra-cervical cylindrical epithelium which has passed beyond the external os (Schröder), or of the cells of the glands (Ruge and Veit). In *carcinoma* of the parenchyma the histogenetic origin of the cells is still enveloped in obscurity. Virchow regards it as arising solely from the cells of the connective tissue, which would make it harmonise very well with Cohnheim's hypothesis. The latest researches of Ruge and Veit go to support this doctrine. According to them, cancer is most frequently due to a transformation of the cells of the connective tissue, even when it has a papillary form, into cauliflower growths. The vascularised connective tissue would return to the embryonic condition, and its young cells would take on an epithelioid appearance. In some exceptional cases, however, they have seen œdematous growths, themselves produced by the glandular epithelium, give rise to carcinoma.

Anatomical varieties.—From a clinical standpoint, and when the cancer can be observed at its very commencement and before its propagation to neighbouring parts has altered its

primitive appearance, four varieties can be distinguished: 1. the papillary; 2, nodular; 3, excavating; 4, liminary or vaginal.

1. *Papillary variety* (syn.: *superficial cancroid of the vaginal portion of the cervix, vegetating form, cauliflower excrescences*).—This variety commences at that portion of the cervix which is situated below the vaginal insertions, and long remains localised to its surface. The new growth often takes origin in the cylindrical epithelium that covers the external surface of the cervix, as we have seen when treating of metritis. Thus, without any doubt, *ulceration*, at first benign, can be transformed into an epithelioma. It soon takes on a papillary and fungating appearance, and the invaded lip is covered by a kind of mush-

Fig. 173.—Cancer of the cervix, papillary form.
Squamous epithelioma of the infra-vaginal cervix (section, natural size).

room, under which may be hidden the os and the healthy lip. For a long time the affection may increase locally, but at some time or other it reaches the vaginal cul-de-sac, invades it superficially and deeply, and from here spreads to the peri-uterine tissues. More rarely it spreads within the cervical canal.

There is nevertheless an accompanying lesion of the mucous membrane, which, according to the experience of K. Abel,*

* K. Abel. Ueber das Verhalten der Schleimhaut des Uteruskörpers bei Carcinom der Portio vaginalis (Arch. f. Gyn., 1888, vol. 32, part 2, p. 271).—Landau and Abel. Beiträge zur pathologischen Anatomie des Endometrium (Arch. f. Gyn., 1889, vol. 34,

is of very frequent occurrence. Abel, who is a pupil of Landau, has removed from this variety the exclusively cervical character which Schröder thought himself justified in reserving to it. In seven cases of this class studied in Landau's practice he found three times a sarcomatous degeneration of the mucous membrane of the body of the uterus, and twice lesions of doubtful interstitial endometritis that seemed to be turning into sarcoma. According to him, the malignant degeneration would then occur concomitantly, though taking on different histological characters, in the cervix and in the body. I am bound to say, however, that these assertions of Abel have been strongly controverted, and are as yet far from being generally accepted.*

2. *Nodular variety* (syn.: *parenchymatous variety, carcinoma*

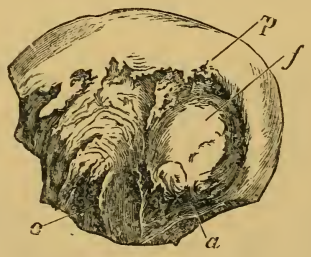

Fig. 174.—Cancer of the cervix, nodular variety.

p, intact zone of squamous epithelium; *f*, cancerous nodule; *a*, os externum; *c*, cervix.

of the cervix, cancerous nodules, circumscribed or infiltrating).—This variety begins by the formation of one or more nodules situated under the mucous membrane of the cervix either on its external or its internal surface, and only ulcerating much later; unrecognised islands may exist at a distance, even though the lesion seems to be very limited.

By the progress of the disease the nodule destroys the mucous

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part 2, p. 165).—K. Abel and Landau. Ueber das Verhalten, &c. (Arch. f. Gyn., 1889, vol. 35, part 2, p. 214).—Eigenartige interstitielle Endometritis oder sarkomatöse Degeneration der Uterusschleimhaut (Centr. f. Gyn., 1890, No. 38, p. 673).—L. Landau. Zur microscopischen Diagnose der Gebärmutterkrebses (Ibid., p. 675).—Abel and Landau. Sarkoma Endometrii und Stückchendiagnose (Ibid., p. 845), Discussion: Waldeyer (Ibid., p. 849) and Hofmeier, p. 850.

* E. Fränkel.—Arch. f. Gyn., 1888, vol. 33, part 1, p. 146.—Eckardt (cited by Landau and Abel), *loc. cit.*, p. 173.—E. Saurenhaus. Das Verhalten des Endometrium bei Carcinom der Portio vaginalis oder des Cervix (Zeitschr. f. Geb. und Gyn., 1890, vol. 18, p. 9).

coat, and cancerous ulceration is fully developed. Similar nodules formed in the cervix and the body of the uterus fuse with the first, and soon the whole organ and sometimes the neighbouring tissues are found to be implicated.

3. *Excavating variety* (syn.: *cancer of the mucous coat of the cervix, perforating cancer*).—The primary seat of development of this variety is the mucous membrane of the cervical canal or the parts immediately beneath; it proceeds by an infiltration which soon ulcerates and leads to the destruction of the cervix by a slow kind of erosion; in some cases the cervix, eaten away thus from its internal surface, has almost disappeared. In this there is something analogous to the retraction of the nipple in cancer of the breast. The body of the uterus is very quickly involved by

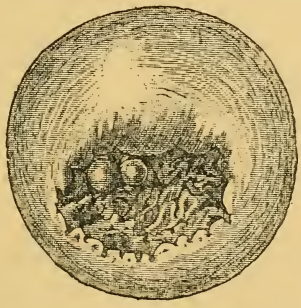

Fig. 175.—Cancer of the cervix, excavating variety at its commencement.

this form of cancer, which afterwards destroys the peri-uterine connective tissue, and very slowly the vagina, but this latter is often not attacked at all.

4. *Liminary* (*limen*, the threshold) *or vaginal variety*.—This variety is infinitely more rare than the preceding, but cannot be passed over in silence. The disease commences in the posterior cul-de-sac, just as some cancers of the tongue may be seen to have their starting-point in the floor of the mouth. It invades in its progress at the same time the cervix and the neighbouring portions of the vagina, where it leads to very extensive ulceration.

Histological varieties.—The three histological species that are most commonly met with are, 1, squamous epithelioma, either tubular or lobulated; 2, columnar epithelioma; 3, carcinoma or atypical epithelioma. In France, since the works of Ch.

Fig. 176.—Cylindrical epithelioma, which commenced in the upper portion of the cervix and invaded the body of the uterus (x 150).

m, *e*, hypertrophied glands of the body of the uterus, similar to those seen in chronic endometritis; *l*, enlarged cavity of a gland; the walls of the gland show several layers of epithelium; *e*, wall of an analogous gland, with several layers of cells; *v*, vessel; *c*, connective tissue. (Cornil.)

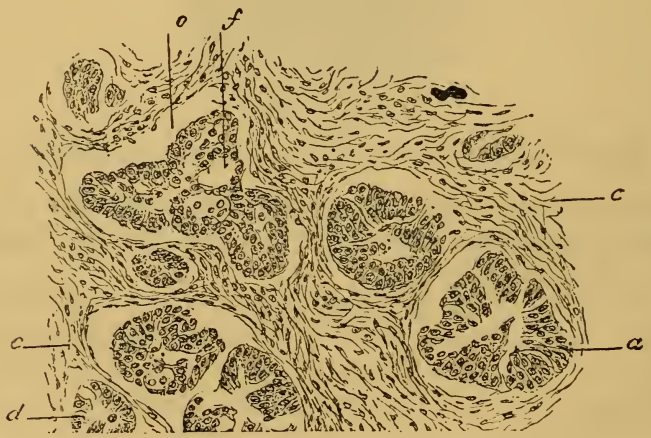

Fig. 177.—Cyclindrical epithelioma of the body of the uterus, which commenced in the cervix (x 150).

c, *c*, connective tissue; *a*, cavity filled with cells, of which the most external are cylindrical. These cells have a tendency to separate from the wall. This separation is very clear at *o*; in the middle are islands of epithelium; cavities, *f*, are often seen, filled with mucous cells, or large cells undergoing mucoid degeneration. (Cornil.)

Robin, Lancereaux, Cornil, and Malassez, the epithelial doctrine of cancer is the most favoured, and carcinoma is itself considered as an alveolar epithelioma, a peculiar variety, a stage in the evolution of epithelioma, and not as a new growth primarily developed at the expense of the cells of the connective tissue.* When dealing with diagnosis I shall speak of a rare variety of cancer of the cervix, *sarcoma*.

Squamous epithelioma, lobulated and tubular, rarely becomes

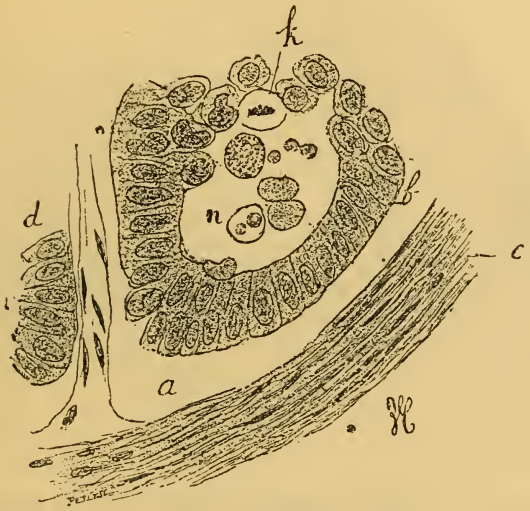

Fig. 178.—Cylindrical epithelioma of the body of the uterus, which commenced in the cervix (x 400).

b, Epithelial covering formed of a single layer of cylindrical cells; *k*, cells undergoing karyokinesis; *n*, free cell undergoing degeneration; *c*, connective tissue; *d*, cylindrical cells belonging to a neighbouring alveolus (Cornil).

generalised; Virchow has, however, seen some examples of it. The generalisation of columnar epithelioma, on the other hand, is more frequent.

Squamous epithelioma is especially met with in the superficial varieties (papillary and vaginal). The so-called *lobulated* variety is formed by agglomerations of cells that are separated by fibro-muscular bands that are easily recognisable; these cells may undergo colloid degeneration, or may form cornified epidermic globes.

* Cf. for histological details: Cornil. Histology of epithelioma of the cervix (Journ. des conn. méd., 1889, p. 44).—Barraud. Thesis, Paris, 1889, pp. 20—27.

The *tubular* variety is formed by rows or cylinders stuffed full with epithelial cells, anastomosing and infiltrating between the fibro-muscular spaces that still resist invasion. In sections, the epithelial cells in the lumen of the tubes are seen to have undergone change in shape through pressure, and from squamous have become cubical.

Cylindrical epithelioma ordinarily corresponds to the form of

Fig. 179.—Carcinoma, or atypical epithelioma (section of one of the nodules in fig. 174).

In a median section is seen the point where the squamous epithelium ends, and where it is replaced by an erosion presenting an almost papillary structure, and in which are glands ramifying to a greater or less extent. The stroma of the new growth is formed by fibrous bands which divide it into alveoli of different sizes, and these are further sub-divided by secondary fibrous partitions. These alveoli are filled with polymorphic cellular elements, and the exact origin of the nests of cancer cells is difficult to determine; it seems, however, that they come from glandular cavities that are distinctly recognisable, some of which are lined by a single layer of cylindrical epithelium. These cavities, by the proliferation of epithelial masses, have been transformed into solid cords. The normal glands are well preserved at the surface, and can be followed right up to the centre of the cancerous nodule (Wyder).

uterine cancer, which commences at the cervix, and, in consequence, bears a great resemblance to that of the body of the uterus (figs. 176, 177, 178). It commences by a typical glandular proliferation (adenoma), which passes into an atypical proliferation (malignant adenoma, which is neither more nor less than an

epithelioma). Cornil has insisted upon the great histological resemblance between glandular metritis and some stages in the development of cylindrical epithelioma.

Atypical epithelioma, or the *carcinoma* of most German writers, is not to be very clearly distinguished from certain forms of tubular squamous epithelioma. It is characterised both by the polymorphism of the cells, which no longer recall either covering cells or gland cells, and by their arrangement in masses, in alveoli the walls of which are formed by anastomosing connective tissue trabeculæ (fig. 179). When the fibrous network is loose, the cellular element predominant and full of juice, the tumour is said to be *encephaloid* (fig. 182); when it is hard and dry, it

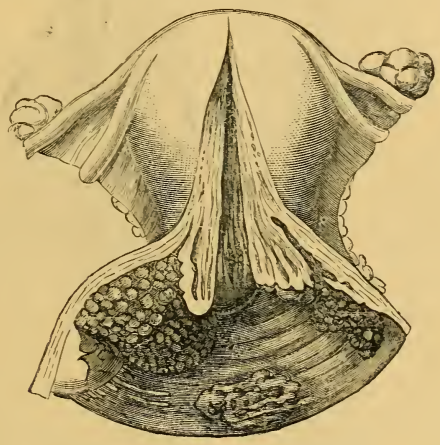

Fig. 180.—Epithelioma of the cervix propagated to the vagina (papillary variety).

is a *scirrhus*. This latter is the character of the majority of nodular cancers (fig. 174.)

Methods of extension.—At the latter end of the disease, the characters proper to each variety become effaced in the midst of the enormous lesions in which the cancer terminates by its extension. This extension takes place in several directions: 1st, the vagina; 2nd, the body of the uterus; 3rd, the pelvic connective tissue and the broad ligaments; 4th, the ureters and bladder; 5th, the rectum; 6th, the peritoneum; 7th, the lymphatic glands.

Extension to the *vagina* takes place, so to speak, at the very outset in the variety that I have denominated "liminary"; it is

very rapid in the papillary form; the epithelioma may then be seen to descend almost down to the vulva (fig. 180).

Invasion of the *body* is slower in the papillary variety; but it must not be forgotten that its mucous coat may then undergo, if not a degenerative change (Abel), at any rate an intense inflammatory proliferation, which places it in a particularly favourable condition for the spread of the cancer. The body is very quickly attacked in the excavating variety, and it may be affected from the very first in the nodular form.

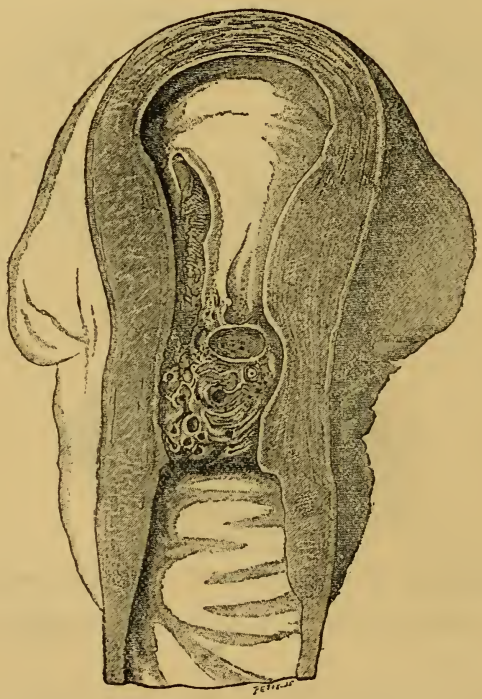

Fig. 181.—Epithelioma of the cervix, excavating variety (on the left is seen a spindle-shaped extension into the body).

Sometimes when a body that has been invaded by a cancer of the cervix is examined, there is seen a very clear line of demarcation* at the edge of the morbid tissue, even when it has only left above it a small portion of healthy uterine tissue.

* In a uterus that I removed *per vaginam* there co-existed with a cylindrica epithelioma of the body a squamous epithelioma of the cervix; by the naked eye a large band of healthy tissue was to be seen, that separated the two neoplasms. Charrier Bull. Soc. Anat., Oct., 1890, p. 431.

The *pelvic connective tissue* may be affected by extension from the vaginal culs-de-sac, the cervix, or the uterus; the organ is then imprisoned in a case, as if some solidifiable material had flowed around it and set. The broad ligaments are thickened and shortened, which renders them perfectly inextensible. The vessels and nerves that traverse the cellular tissue of the true pelvis, and notably the roots of the sciatic nerves, may also be

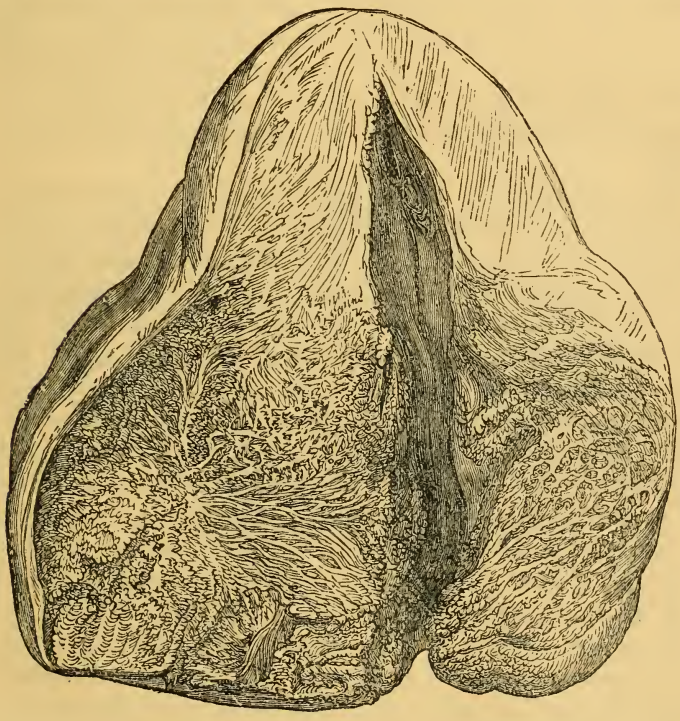

Fig. 182.—Epithelioma of the cervix which has invaded the body of the uterus (encephaloid variety).

involved, giving rise to the œdema and intolerable pain that are noticed towards the end of the case.

The *ureters*, by reason of their proximity, are very soon compressed by the development of the cancer. As a matter of fact, instead of simply pushing them on one side, as does a fibroid, the malignant neoplasm absorbs into itself, so to speak, the parts by continuity of tissue. Rarely the wall of these ducts is ulcerated and a ureteric fistula produced. Most commonly there occurs

narrowing of the lumen; the calibre of the ureters being lessened close to their opening into the bladder, the ducts above dilate right up to the pelvis of the kidney by reason of a constant accumulation of urine, subjected to a considerable pressure.

The extreme frequency of the *renal* lesions in cancer of the cervix, which was long ago recognised, has been studied anew with more care of late years. Lancereaux* does not hesitate to declare that this ascending nephritis is a constant phenomenon, even in the earliest stages of the disease; he has never found it absent in all the autopsies he has made during a period of 25 years, except in a few cases where the fatal termination was prematurely brought about in consequence of profuse metrorrhagia.

The experiments of Straus and Germont† on the effects of ligaturing the ureters in animals, which confirm and give precision to the observations made at an earlier date by Aufrecht in Germany, Charcot and Gombault in France, throw much light upon the pathogenesis of the lesions in question; they have demonstrated the progressive atrophy of the kidney, which soon renders a distinction between the two renal tissues impossible, disappearance of the papillæ (only in the guinea-pig) and extinction of the pyramids. Now the lesions that are met with at the autopsies of women who have succumbed to cancer of the cervix are very analogous.‡ The ureters are dilated to an extent of reaching the size of the external iliac, the aorta, or even the small intestine; their walls are thickened and their direction is sometimes sinuous. The pelvis is distended, especially at its middle portion; it is conical or pear-shaped. When its dimensions are excessive and exceed the size of the closed fist, it forms a recognisable tumour, upon which the remnant of the kidney is stuck, like a helmet, to use Rayer's comparison.

The special characteristic of the lesion is, as in Straus's and Germont's experiments, change in the papillæ and pyramids. The papillæ first of all become flattened, their free extremity is pressed back, and instead of a projection there may even come to exist a depression.

* Lancereaux. Nephritis consecutive to uterine epithelioma (Ann. des mal. des org. génito-urin., 1884, pp. 417, 482, 540).

† Straus and Germont. The histological renal changes in the guinea-pig, after ligature of the ureter (Arch. de phys., 1882, 2nd series, vol. 9, p. 386).

‡ L. Leca. The secondary lesions of cancer of the uterus, Thesis, Paris, 1888.

Later still, nothing remains of the secretory substance of the kidney, and in its place there is a fibrous membrane which limits a cavity bridged over by the columns of Bertin, for they long remain intact. This gives rise to the multi-loculated appearance of the kidney.

The cellular tissue which unites the bladder to the cervix being invaded, the disease soon spreads to the bladder itself, and a condition of catarrhal inflammation is produced; islands of the mucous membrane may slough or be eaten away by the

Fig. 183.—Cancer of the cervix extending to the vagina and bladder, which it has perforated.

morbid tissue which penetrates into the vesical cavity, at the same time forming a fistula (fig. 183).

Inflammation of the ureter and septic pyelo-nephritis is one of the first and most serious consequences of extension to the bladder. It ends in producing miliary abscesses in the kidney. This change, however, is much less common than interstitial nephritis. In their statistics bearing on 51 cases, Caron and Féré* only note seven cases of suppurative pyelitis and miliary abscess of the kidneys; the rest only showed changes dependent

* C. Féré and Caron. Statistical study of the complications of cancer of the uterus; based on 51 autopsies performed at the Salpêtrière (Prog. méd., 1883, p. 1049).

upon mechanical conditions, *i.e.*, dilatation of the ureter and hydronephrosis with accompanying renal change. Lancereaux, out of 23 cases, only mentions a single case of suppuration in the kidneys.

Is the condition of the heart modified by this interstitial nephritis, and agreeably to Traube's* theory, is there any hypertrophy of the left ventricle? Some autopsies demonstrate the existence of this lesion explicitly. Straus,† in a work devoted to the confirmation of Traube's law, has mentioned two cases of cancer of the cervix with secondary nephritis and considerable hypertrophy of the heart. Four similar cases have been published by Artaud‡; yet others have been considered in the theses of Weill and Thouvenet.§ However, in 1884, Lancereaux, in his paper based upon 23 personal observations in which an autopsy was performed, has arrived at an opposite conclusion. In these 23 autopsies the heart was each time carefully weighed, and all the details of the necroscopic examination were recorded most carefully. Now, on 21 occasions the heart was found to be abnormal, being either small or atrophied. Often it was soft, flabby, and covered with fat on the anterior surface and about the base. In two cases only were the weight and size of the heart increased, and then there co-existed arterial lesions (atheroma of the aorta, aortic incompetence), which would fully explain the hypertrophy. This important series of cases seems demonstrative. It appears clear that the cardiac lesion only exceptionally accompanies the nephritis of cancer, and this obtains, without doubt, because of the too rapid evolution of the cancer. Letulle‖ has therefore thought himself justified in saying that "the idea

* This is the theory: the kidney change, by destroying a certain number of arterioles narrows the circulatory field, and, in consequence, raises the arterial pressure. This is further increased by the functional insufficiency of the kidney, the blood remaining loaded with an excess of water, and an abnormal proportion of excrementitious products. The cardiac hypertrophy is the direct and necessary consequence of this increase of intra-vascular pressure.

† I. Straus. Renal disease and its relation to cardiac hypertrophy (Arch. gén. de méd., 1882, 7th series, vol. 9, p. 5).

‡ G. Artaud. On nephritis determined by compression of the ureters in cancer of the cervix, and on consecutive hypertrophy of the heart (Rev. de méd., Nov., 1883, p. 905).

§ Weill. Cardiac hypertrophy in nephritis, consecutive to affections of the urinary excretory ducts. Thesis, Lyons, 1882.—Thouvenet. Contrib. to the study of diseases of the heart in dis. of the urinary apparatus. Thesis, Paris, 1888.

‖ Letulle. Note concerning a case of cancer of the cervix, terminating by uræmic symptoms (Progrès méd., 1886, p. 737).

of a cardiac hypertrophy of renal origin, which is so fruitful in pathology, and so powerfully supported from different standpoints by Traube, Potain, Charcot, Straus, and many other observers, was rather compromised than assisted the day when application was made to cancer of the uterus to obtain from it an argument in its favour."

There is yet one lesion that is met with at the autopsies of women who have died of cancer of the uterus, warty endocarditis, which was described by Lancereaux, who found it in two of his twenty-three cases. By this name he designates a special variety of vegetating endocarditis, which he absolutely separates from ulcerative vegetating endocarditis, which is seen as a rule at the end of certain affections that induce cachexia (cancer and tuberculosis). The nature of these vegetations has not yet been definitely settled; it is probable that they are of bacterial origin.

The rectum is much more rarely affected secondarily, and fistulous communication with it is uncommon.

The peritoneum defends itself against the approach of the new growth by the production of adhesions which obliterate its cavity at the limits of the disease. Hence it comes that during an operation for hysterectomy Douglas's pouch seems sometimes so far removed from the vaginal cul-de-sac.

In very advanced cases the vagina may be found transformed into a kind of cloaca into which open both the bladder and the rectum. Above, the true pelvis is filled by a mass of cancer, in which the fundus of the uterus and the appendages are discovered with difficulty beneath a protective agglomeration of coils of intestine that cover and cut off the disease from the general abdominal cavity. But the gut in its turn may also be perforated.

The pre-vertebral, iliac, and inguinal* glands are often affected. Troisier† has recently drawn attention to the changes

* The inguinal glands, contrary to general opinion, may be affected without any preliminary affection of the vagina. As a matter of fact the lymphatics of the cervix communicate with those of the body, which themselves communicate with the inguinal glands by vessels accompanying the round ligaments. This arrangement, which had already been pointed out by Mascagni, was re-demonstrated by Poirier (Barraud, Thesis, Paris, 1819, pp. 19, 20).

† Troisier. Affection of the left supra-clavicular glands in abdominal cancer. Report on a case of André Petit (Bull. et Mém. de la Soc. méd. des hôp., Jan. 13, 1888, p. 21).—Disease of the supra-clavicular glands in abdominal cancer (Arch. gén. de méd., Feb. and March, 1889, 7th series, vol. 23, pp. 129, 297).

in the left supra-clavicular glands which sometimes occur (independently even of invasion of the lungs or of the pre-vertebral glands) in abdominal cancer generally, and in uterine cancer in particular. It is probable, as Troisier has suggested, that this isolated manifestation is due to a direct infection of the glands by the reflux of infected lymph from the thoracic duct, into which these glands empty themselves by very short lymphatic vessels. We have here a curious fact in pathological anatomy, and at the same time a valuable clinical datum by which to decide whether operation is contra-indicated or no. Amongst the distant and secondary lesions must also be noticed fatty degeneration of the liver, which is common in post-mortem examinations on cases of uterine cancer, as Leca* has pointed out. It seems as if the septic materials absorbed by the organism from the surface of ulcerated or sloughing cavities act upon the liver much in the same way as some steatogenous poisons, *e.g.*, phosphorus and alcohol. This degenerative change in the liver has, moreover, long been recognised in other forms of surgical septicæmia (Verneuil).

Lastly, metastatic growths are sometimes seen in distant organs, such as lungs, stomach, and kidneys.

Symptoms.—The commencement is insidious, and it may be said that there exists at first a latent period, during which patients preserve all appearances of health even with somewhat advanced disease. And this is why it is so uncommon to see the initial changes. Attention is generally drawn for the first time by some loss of blood, often extremely small, at another than the normal menstrual period, after fatigue, often after coitus or defæcation. But this accident, arising frequently in women who are approaching the climacteric, is taken for an irregularity of no importance, and is passed over unnoticed ; it is only by its frequent repetition that it arouses attention. Sometimes even the hæmorrhages appear fairly regularly every month, and are regarded as a restoration of the menstrual function, being welcomed with satisfaction by patients who think they see therein a kind of return of youth.

These early hæmorrhages are not furnished by an ulcerated surface ; they are due to an accompanying metritis, or simply to congestion provoked by the presence of the neoplasm,

* Leca. *Loc. cit.*, p. 55.

which plays the part of an irritative stimulus. They may be compared to the early hæmoptysis of pulmonary tuberculosis.

Leucorrhœa now also makes its appearance, but without any special characters. Lastly, pain and reflex phenomena from the side of the digestive apparatus, circulation, and nervous system reproduce the pathological cycle that I characterised in the chapter on metritis under the name of "symptoms accompanying uterine disease."

One cannot, however, arrive at a diagnosis without the assistance of a local examination. The finger recognises induration with a papillary or ulcerated condition of the cervix; the speculum shows a livid appearance of the swellings, or the yellowish tint of ulcerated surfaces and cauliflower or mushroom growths. I described, when dealing with the pathological anatomy, the various forms that may be seen at the commencement of a case.

Soon after, a second period comes on, which may be called the period of declaration. All the phenomena become prominent; the hæmorrhage returns more frequently, and the flow becomes pink or reddish, like "shreds of flesh" or "washings of meat," to use the expressions of hospital patients; it has taken on a faint, nauseating, or a fœtid, repulsive smell; its abundance and acrid nature lead to erythema of the thighs and vulvar pruritus that are often most painful. At the same time the pain, which is particularly felt in the lumbar region, has become more severe, and to it have been added various neuralgic manifestations. At this time digital examination may show that the vaginal culs-de-sac are free; but often they have already become invaded; the uterus still remains movable, or is fixed more or less completely by extension of the disease to the pelvic cellular tissue. I lay much stress with reference to local examination on the superiority of the information yielded by touch and bi-manual palpation over that yielded by the speculum. One is surprised, if the natural order of these explorations has been inverted, to find with the finger changes far and away more extensive than sight would have led one to suppose. Sometimes a cervix which appears scarcely swollen and only slightly ulcerated through the speculum, appears to the finger as a large tumour fixed deeply by an advanced extension of the disease.

Digestive troubles, anorexia, constipation, flatulence, have by this time become of great importance and compromise the general nutrition.

Soon there arrives a third phase, the period of cancerous cachexia; the skin takes on a pallid, yellowish tint, which Barnes long ago attributed to the absorption of a portion of the decomposed fæcal matters retained within the body, owing to obstinate constipation (copræmia); in addition it becomes particularly dry and rough. It is now that painful phenomena of cystitis arise, intolerable neuralgiæ produced by compression or invasion of the nerves, phlegmasia dolens and fistulæ. Local examination reveals extension to neighbouring parts, and already, by this time, another symptom has noiselessly entered upon the scene, uræmia; by analysis of the urine the surgeon can convince himself to what a low degree the excretion of urea has fallen, and this is not simply due to the general weakness, but also to incompetency of the kidneys. The exacerbation of the gastric symptoms and vomiting are undoubtedly an indication of slight successive attacks of sub-acute uræmia.

But, by degrees, the uræmia becomes chronic, and then it is a real benefit to the patients, for it blunts sensibility and intelligence at the same time. They survive a few days longer in a condition of semi-somnolence, scarcely replying to questions, motionless and indifferent to surroundings. Then they quietly pass away, and it is in this way that the majority of patients die. Convulsions of the eclamptic type are extremely rare; I have once seen the dyspnœic variety of uræmia.

Peritonitis, by extension or perforation, or embolism, may hasten the fatal event. It is evident that septicæmia, due to absorption of putrid material, has a great deal to do with the final symptoms, particularly if suitable treatment be not instituted; it may itself lead to death.

Pregnancy as a complication.—Conception may occur when there is cancer of the cervix, although that condition is evidently very unfavourable to fecundation. Several times women have presented themselves to the accoucheur in a pregnant state when, on a previous occasion, cancer that had complicated the labour had been found.

Cancer is a great predisposing cause of abortion. Out of 120 women who were affected with cancer of the cervix during

pregnancy, and treated by Lever at Guy's Hospital, 40 per cent. aborted.* Hanks † believes that abortion generally occurs before the third month. If the sixth month be safely got over, the chances are that parturition will occur a little before the normal period.

In some cases, on the contrary, the pregnancy, instead of being arrested in its course, continues, and is even prolonged beyond the normal nine months. Chantreuil ‡ cites three conclusive cases of this prolonged pregnancy; the most interesting was published by Menzies (of Glasgow). A series of ineffectual efforts has been known to be repeated at distinct intervals, and finally wear out the patient; it constitutes a veritable repeated labour. The uterus has occasionally been ruptured in one of these fruitless endeavours at expulsion.§

The prognosis for a woman affected by cancer is therefore rendered still more serious by pregnancy. Firstly, because abortion may cause fatal hæmorrhage or septicæmia; secondly, because if she go to term the accouchement is serious. Herman ‖ out of 136 cases gives 40 deaths caused by parturition. Older statistics are still more unfavourable: Chantreuil gives 25 deaths out of 60 patients who came to term, and West 41 out of 75.

Out of 128 children borne of cancerous mothers only one-half were born alive (Herman). I shall have occasion to return to the complication of pregnancy in the chapter upon treatment.

Diagnosis.—I have described elsewhere the differential diagnosis between cancer at its commencement before ulceration sets in, and chronic metritis, and between cancer after it has ulcerated and catarrhal endo-cervicitis. Stratz ¶ lays much stress upon the yellowish colour and the granular and brilliant appearance of non-ulcerated cancer. In doubtful cases one ought always to make a microscopic examination of an excised

* Lever. Organic diseases of the uterus, cited by Gallard. Clinical lectures on diseases of women, Paris, 1879, p. 961.

† Hanks. Pregnancy complicated by uterine tumours (Amer. Journ. of Obstet., March, 1888, p. 242.

‡ G. Chantreuil. Influence of cancer of the uterus on conception, pregnancy, and delivery, Paris, 1872.—Bar. Uterine cancer during pregnancy and delivery. Thesis, Paris, 1886.

§ Bousquet. Uterine cancer; pregnancy; rupture of the uterus (Répert. univ. d'Obst. et de gyn., 1889, p. 387). A macerated fœtus at term was extracted by version.

‖ Herman. On the treatment of pregnancy complicated with cancerous disease of the genital canal (Trans. Obst. Soc. Lond., 1878, vol. 20, p. 234).

¶ C. H. Stratz. Zeitschr. f. Geb. u. Gyn., 1886, vol. 13, part 1, p. 89.

morsel (Schröder). If one were obliged to wait, the progress of the disease would soon suffice to put all doubts at rest. Moreover, I have often noticed that, almost always, cases in which any doubt exists, are not cancerous.

The vegetations formed by benign papilloma, which are seen in cases of vaginitis, or around mucous tubercles, must not be confounded with the fungoid productions of cancer. Their multiplicity and dissemination, their characteristic cock's-comb appearance will prevent all error. Then, too, the reddish and fœtid discharge, which is very different from the purulent discharge of vaginitis, hardly accompanies anything but malignant disease.

A circumscribed cancerous nodule of the cervix may be very difficult to distinguish from a small fibroid. However, the latter is more clearly defined, and there is no sign of infiltration or inflammation around it; the mucous coat, too, is not adherent to a fibroid, as it is to a cancer (Spiegelberg*).

Some columnar epitheliomata of the cervix present a polypoid appearance, which might cause them to be confounded with certain benignant mucous polypi.† In such cases there may be cancerous nodules of the mucous coat of the body and the cervix, projecting externally. The surgeon must make certain by means of dilatation and intra-uterine examination, or, if necessary, by an exploratory curettage. All these considerations relate to cancer at its commencement. Later on, invasion of neighbouring parts, the progress of the ulceration, the frequent metrorrhagia and abundance of a fœtid secretion, will render the diagnosis easy. There is, however, an affection with which confusion has been made, even at this stage; it is a fibroid of the cervix or a polypus of the body, arrested by strangulation or by adhesions in a dilated and effaced cervix, when the fibroid has been altered either by spontaneous decomposition or by incautious applications of caustics. Hæmorrhage, fœtid discharge, a fungating and sloughy appearance of the new growth, all add to the confusion, and the patient, exhausted by profound anæmia, seems as if affected with the cancerous cachexia. There is only one symptom that can enable us to avoid error, but it is pathognomonic; the external os must always be sought

* Spiegelberg. Die Diagnose des ersten Stadium's des Carcinoma colli uteri (Arch. f. Gyn., 1872, vol. 3, p. 233).

† Montfumat. Thesis, Paris, 1867.—Richet. Gaz. des hôp., Aug. 25, 1885, p. 770.

after; in the case of a degenerated fibroid it can be felt as a thin but continuous collar around the tumour, and the tip of the finger can be introduced between this diaphragm and the morbid mass; frequently, also, the latter is at its margin smooth, firm, and free from ulceration. In such a case I was able, on one occasion, to enucleate a sloughing intra-cervical tumour, and cure a patient who had been sent me from the country by a distinguished physician as the subject of cancer, beyond the reach of operation. While dealing with diagnosis, I shall make a few remarks upon some exceptional varieties of malignant tumour of the cervix.

Hegar * has seen a very rare variety in an old woman; the cervix was hypertrophied and passed beyond the vulva, without showing the slightest ulceration. C. Th. Eckardt,† in a girl aged 19 years, found a considerable hypertrophy of the cervix, which seemed to have been immediately preceded by carcinomatous degeneration.

Schröder, at a post-mortem examination, found an intra-cervical cancer of the supra-vaginal cervix that was suggested by nothing external.‡

Sarcoma of the cervix has been seen so rarely that it cannot be considered as constituting a well-characterised clinical entity. Its manifestations, which are very variable in form, may occasionally cause some difficulty in diagnosis.

Spiegelberg§ described in 1878 a curious case that he calls *sarcoma colli hydropicum papillare* in a young woman aged 17. The case was one of a papillary tumour of the anterior lip, which returned ten months after removal and filled the whole of the vagina with a mass very like a hydatiform mole of the chorion. The microscope revealed its sarcomatous nature together with œdematous infiltration of the stroma. Spiegelberg again in 1879 saw a similar case in a woman aged 31. Winckler‖ cites a similar case of Sänger's.¶

* Hegar. Virchow's Arch., 1872, vol. 55, p. 245.

† Eckardt. Ein Fall von Cervixcarcinom bei einer 19 jährigen Jungfrau (Arch. f. Gyn., 1887, vol. 30, part 3, p. 471).

‡ Schröder, *loc. cit.*, p. 312.

§ Spiegelberg. Arch. f. Gyn., 1879, vol. 14, p. 178; 1880, vol. 15, p. 437, and vol. 16, p. 124.

‖ F. M. Winckler. Arch. f. Gyn., 1883, vol. 21, p. 313.

¶ Kleinschmidt (Ueber primäres Sarkom der Cervix uteri, in Arch. f. Gyn., 1891, vol. 39, p. 7), has lately reported a new example of this lesion.

Ludwig Pernice* has given the description and a drawing of a strio-cellular myosarcoma of the uterus in the cluster shape, seen in a nullipara who had been subject to hæmorrhages for six months (fig. 184). The tumour springing from the infra-cervical cervix was half as big again as a man's fist, and strongly resembled a bunch of violet-coloured grapes, with gelatinous contents. It was removed by amputating the cervix with a bistoury. Histological examination showed that it was a sarcoma with a mixture of striated muscular fibres of an embryonic appearance. Two

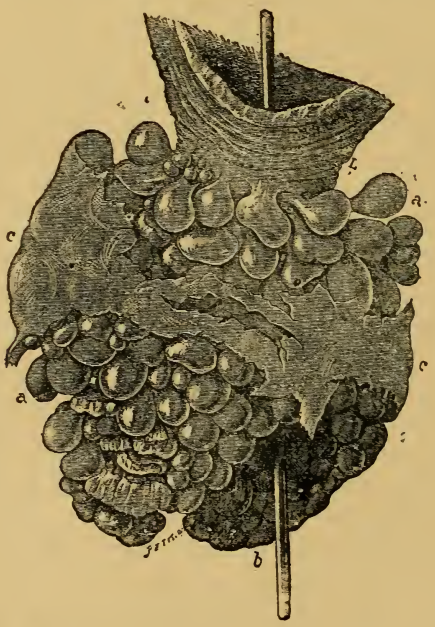

Fig. 184.—Myosarcoma of the cervix (cluster variety) (Pernice).

L, line at which excision was performed; *aa*, *b*, lobules of the tumour; *c*, shred of a thin enveloping membrane.

months later it returned, and on this occasion a tumour as large as a goose's egg was removed. Nine months after the patient returned with an abdominal tumour reaching nearly up to the epigastrium. The laparotomy that was performed was obliged to be only exploratory. The patient recovered from it and died later from pneumonia; the microscope demonstrated that the

* L. Pernice. Virch. Arch., July 3, 1888, vol. 113, p.

second and third tumours were also sarcomatous but had not undergone myxomatous degeneration.*

P. Mundé † has seen a tumour that was plainly malignant, and which he says was a myxadenoma that had become converted into a myxosarcoma. The patient, who was aged 19, had suffered for two years from severe leucorrhœa and complete amenorrhœa. The vagina was filled and the hymen pressed forward by a friable tumour, which broke into fragments like muscatel grapes. It was removed by the serre-nœud, and the

Fig. 185.—Fibro-adenoma of the cervix uteri (Thomas).

centre was found to be fibrous; it was found, after re oval, that it sprang from the cervix, but that there were also traces of myxomatous degeneration at certain spots of the vaginal culs-de-sac. A month and a half later the growth returned.

* Pfannenstiel (Das traubige Sarcom des Cervix Uteri, in Centr. f. Gyn., 1891, No. 42, p. 855) has recently described a new case of cervical cluster-sarcoma which he removed; a return of the growth necessitated hysterectomy; six months later it returned again. The author has collected eleven similar cases in this paper.

† P. Mundé. A rare case of adeno-myxosarcoma of the cervix uteri (Amer. Journ. of Obst., Feb., 1889, p. 126).—G. Thomas (Diseases of women, 1880, p. 560) has published a personal observation of a cluster fibro-adenoma in a young woman whose vagina was completely blocked up by the new growth, which grew from the internal portion of the cervix. The drawing which Thomas gives shows very clearly the great difference in appearance between this growth and an ordinary mucous polypus;

Histologically, it was composed of an immense number of cysts of a myxomatous nature, in the stroma of which were many lymphoid and sarcomatous cells. It seemed to Mundé as if this was an example of the malignant degeneration of a tumour which was at first benign.

Thiede* has described under the name of *fibroma papillare cartilaginescens*, a tumour observed in a woman aged 40. It was lobulated, and had a spongy appearance, and sprang from the cervical mucous membrane; removal was followed by return of the growth and death. On cutting into the tumour, islands of hyaline cartilage were found in the midst of a fibrous stroma rich in dilated vessels; there were none of the histological characters of a sarcoma. With this case may be compared a case of Rein's† that he has called *myxoma enchondromatodes arborescens colli uteri*. The patient was 21 years of age; the tumour, which was lobulated and soft, was completely removed, but returned and quickly led to death. On section it was seen to be composed of a soft tissue subdivided by fibrous bands into islands, of which some had the appearance and the histological structure of Wharton's jelly; in the middle were some portions formed by the myxoma, in which the microscope revealed nodules of hyaline cartilage.

Lastly, Winckel‡ has described and given a figure of an adeno-myxoma cervicis, removed from the anterior cervical lip in a woman aged 40; it returned very soon and invaded the vaginal

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the microscopic examination, however, only revealed glands and connective tissue. No information is given as to what became of the woman after the growth had been removed by the écraseur. I reproduce here the drawing of this exceptional case, which may be advantageously compared with that of Pernice. One can see how much two tumours, the one probably benign (Thomas), the other evidently malignant (Pernice), may resemble each other in appearance. Histological examination and observation of the clinical progress are the sole elements upon which a diagnosis can be founded. Mundé compares Thomas's case to his own, as far as external appearance goes, but nothing can be therefrom deduced, in the absence of sufficient information. The information given by Thomas cannot lead to a supposition of the malignant nature of the growth. It seems to me to be more nearly akin to the case described by Ackermann (fig. 137) as a *papillary fibroma with glandular hypertrophy*.—It is, on the contrary, quite certain that the case of polypoid tumour of the cervix published by O. Weber, was a cancer (Ueber die Bildung quergestreifter Muskelfasern. Virch. Arch., 1867, vol. 39, p. 216). Mundé has, however, no real right to compare it with his own.

* Thiede. Zeitschr. f. Geb. und Gyn., 1877, vol. 1, p. 430.

† Rein. Arch. f. Gyn., 1870, vol. 15, p. 187.

‡ Winckel. Lehrb. der Frauenkr., 1886, p. 430.

culs-de-sac; the patient was lost sight of. On section the tumour was found to be made up of alveoli full of transparent mucus; microscopic examination showed that the tumour was of mixed nature, and probably from being an adenoma at first, became transformed into a sarcoma, which itself had undergone myxomatous degeneration. This peculiar hybrid condition, according to Winckel, would establish a kind of transition between epithelioma and sarcoma.

The rare cases that I have just described deserve to be specially indicated from a nosological point of view, but their distinction is of greater interest to the morbid anatomist than to the surgeon. All these malignant tumours, for him, come under the one denomination of "cancer."

A very important part of the diagnosis is the diagnosis of extension. Bi-manual palpation, vaginal and rectal examination combined with methodical lowering of the uterus, will give exact information on this subject. If necessary, recourse should be had to anæsthesia for the greater convenience of this examination, which is of capital importance with regard to operative interference.

Prognosis.—Cancer, in all its forms, ends fatally. But certain varieties run their course less rapidly, for example, the hard or scirrhous variety of the excavating form.

The average duration of the disease is 16 to 17 months according to Courty; 12 months according to Simpson. Simpson gives an average duration of two to two and a half years. Fardy O. Barker goes as far as 3 years and 8 months. Arnott, who gives only a small list of cases, though they have been very carefully examined, assigns a duration of 53 to 54 weeks in carcinoma, and 82 to 83 weeks in epithelioma (papillary variety ?) Some cases exceptional in their duration have been reported. Courty* speaks of women who had lived for 7 to 8 years. F. Barker has seen a woman alive 11 years after the disease had been known to be in existence. Emmet† asserts that he has seen life prolonged for 5, 6, and 8 years. These cases may be compared with certain atrophic scirrhi of the breast.

The age of the patient is of very great importance; as a rule the cancer of women aged from 20 to 30 years runs a much

* Courty. *Loc. cit.*, p. 1160.
† Emmet. *Loc. cit.*, p. 513.

quicker course than that of women who are attacked about the time of the climacteric. Those cases of "galloping" cancer, in which return of the growth is very rapid even after hysterectomy has been performed under the most favourable circumstances, almost always occur in very young women.

The variety of the cancer ought also to be taken into consideration when forming a prognosis. There are some non-vascular and little-vegetating cancers (the hard variety of the excavating form) that may take several years to run their course, particularly if the patient has already reached a certain age.

Ætiology.—Women are more frequently affected with cancer than men, and the uterus is the part most commonly attacked. This fact is put beyond question by the important statistics taken by Sir. J. Y. Simpson from the Annual Reports of the Registrar-General for England in the years 1847—1861. It is during the generative life of women from puberty to the menopause (when it attains its maximum) that this frequency of cancer manifests itself. Next to the uterus the breast is most commonly affected.

Race, heredity, age, and struggle for existence are general predisposing causes, the action of which cannot be denied.

The influence of race, which can easily be studied in the United States, is greatly in the favour of negresses, in whom cancer of the uterus is very rare, though fibroids are very common. In a word, according to Chisholm about 1 in 100 whites, men and women, dies of cancer, and only 1 in 300 blacks.

The influence of heredity has been contested. Collecting the statistics that had been published previously, Schröder finds that this cause has been in existence 78 times out of 948 cases. I have myself seen several undeniable cases of it.

The most favourable age is from 40 to 50.* The chief statistics are collected in the following table by Gusserow, † who

* A few cases of extremely early development of cancer of the cervix are known. I will cite amongst the exceptional cases the one recently published by Ganghofner (Zeitschr. f. Heilk., 1888, vol. 9, p. 337) in a young girl aged nine years. The child for two years had suffered from losses of blood; a papillary tumour distended the vagina; it was ulcerated. The tumour was excised and cauterised; the child died a few days after of small-pox. Microscopic examination made by Professor Chiari showed that it was a medullary carcinoma that had in all probability originated in the glands of the cervix.

I mentioned above, when speaking of rare varieties, Spiegelberg's case in a young girl aged 17, and C. Th. Eckardt's case in a girl aged 19.

† Gusserow. Die Neubildungen des Uterus, Stuttgard, 1886.

has added for that purpose his own results to those of Lever, Kiwisch, Chiari, Scanzoni, Säxinger (of Seyfert's practice), Tanner, Hough, Blau, Dittrich, Lothar Meyer, Lebert, Glatter, Beigel, Schröder, Schatz, Winckel, and Champneys, forming a total of 3,385 cases.

17 years	1 case (Glatter)
19 „	1 „ (Beigel)
20-30 „	114 cases
30-40 „	770 „
40-50 „	1,169 „
50-60 „	856 „
60-70 „	340 „
Above 70 „	193 „

Struggle for existence, privations, indubitably favour the development of cancer, and it is also particularly in the lower classes of society that it is most frequently seen. The opposite holds good for fibroids.

Schröder has, from his own practice, drawn up a small comparative table that is highly interesting. It deals with the relation between hospital and private cases:—

	Fibroids.	Cancer.
Out of 14,000 hospital patients	285 (2·3 per cent.)*	——
„ 16,800 „ „	——	603 (3·6 per cent.)
„ 9,400 private „	537 (5·7 per cent.)	209 (2·2 „

Martin drew up a similar table, and found among his hospital patients 3 per cent. of the cases cancer and a slightly higher percentage fibroid; the results among his private patients are similar to those of Schröder.

The local predisposing causes that have been invoked are principally laceration of the cervix and the cervical metritis it brings along with it (Emmet, Breisky). Mangin† has made upon this point some histological researches of great interest. Frequent parturition (Gusserow) has also been accused, but it is possible that it acts simply by the lacerations and the inflammation of the cervix that are so common a result thereof.

* It is probably by an error of calculation that the author says 1·9 per cent.

† Mangin. Marseille méd., Sept. 1838, p. 513.

CHAPTER II.

TREATMENT OF CANCER OF THE CERVIX.

Cancer limited to the infra-vaginal cervix, not reaching the vaginal culs-de-sac. Infra-vaginal amputation of the cervix: Verneuil's method.—Cancer of the whole infra-vaginal cervix. Supra-vaginal amputation of the cervix: Schröder's method.—Cancer of the cervix with invasion of the body, but no extension to neighbouring parts. Vaginal hysterectomy. Method of operation. After-treatment. Various modifications of the operation. Forcipressure of the broad ligaments. Accidents during operation. Statistics of vaginal hysterectomy for cancer of the cervix. Comparative statistics of hysterectomy and amputations of the cervix. Causes of death: hæmorrhage, shock, renal changes, septicæmia. Duration of life in patients who have undergone hysterectomy and amputation of the cervix. Hysterectomy through the perinæum and through the sacrum.—Cancer extended to the neighbouring tissues. Palliative treatment. Curettage and cauterisation. Symptomatic treatment of the leucorrhœa, the hæmorrhages, the erythema of the vulva, the gastric troubles, the pain. So-called specifics.—Cancer complicated by pregnancy, by uterine fibroids, by ovarian cysts.

THE treatment of cancer of the uterus must be divided into two sections, according as a radical cure can be attempted, or as palliative treatment alone is possible.

Radical cure is only possible when the cancer is limited to the organ and has not extended to neighbouring parts. Palliative treatment is applicable to cancer that has spread beyond the limits of the womb, and in which total removal is impossible, or too dangerous, or useless. To conduce to clearness I shall follow this division, and pass in review the various degrees of the disease and the various opinions that their treatment has called forth.

I. *Cancer limited to the infra-vaginal cervix, and not reaching up to the vaginal culs-de-sac.*—Until of late years radical cure of cancer of the uterus was only attempted for cases that were clearly limited beneath the vaginal reflexions, and then sub- or infra-vaginal amputation of the cervix was performed. This operation has yielded very good results to Verneuil, who recommends the use of the écraseur; to Ch. Braun, who uses the galvano-caustic wire loop; to J. Bryne, who advises the use of the galvano-cautery, &c.

Schröder * recommends the use of a cutting instrument. I think it is not only more expeditious, but also safer, than the écraseur and the galvano-caustic wire loop, which expose the patient to the risk of narrowing of the cervical canal and all its consequences. Schröder speaks highly of a conoidal excision, or, by preference, an angular excision of the diseased tissues on each of the lips, taken separately, after having freely split up the cervix.† I consider the bistoury as far superior to all other means of removal. It offers the best guarantee against accidental opening of the peritoneum, and is the only one that allows, throughout the whole operation, of an intelligent and not mechanical procedure, and of removing the cervix higher up or lower down, as necessary. I should, therefore, by preference perform amputation with a cutting instrument, if I thought it indicated, following the rules that I gave when speaking of the treatment of metritis. But, as I shall say later on, however small the extent of the disease, a lesion has only to be of a cancerous nature for me to perform complete hysterectomy.‡

* Schröder, *loc. cit.*, French trans., p. 314.

† Some very brilliant results obtained by these various methods have been published, but the delicate point in many of the older cases is the question of the certainty of the histological diagnosis. Pawlik's statistics, collected from Ch. Braun's practice, give the results of a period of about 20 years. Out of 136 patients on whom infra-vaginal amputation of the cervix was performed by means of the galvano-caustic wire loop, nine died from the operation, viz., a mortality of 6·6 per cent. Thirty-three (or 26 per cent.) lived more than one year; twenty-six (or 20 per cent.) lived more than two years. Two had still had no return after twelve years, and one after nineteen years and a half. Karl Pawlik. Wien. Klin., Dec., 1882, vol. 8, p. 403.—Verneuil, in a discussion at the Surgical Society (October, 1888) reported 22 infra-vaginal amputations by his method with one death. Polaillon, who used the galvanic wire-loop, had one death (by chloroform) out of 200 patients. Marchand out of 12 cases (of which four were performed with the écraseur and eight with the galvanic wire) lost one patient through opening of the peritoneum and secondary peritonitis. Terrillon had seven patients, who all recovered (galvano- and thermo-cautery). Adding to these a case of Schwartz we have 60 cases of infra-vaginal amputations, with two deaths owing to the operation, or 3·33 per cent. In this series Verneuil has one case of recovery, lasting seven years, one lasting five years, and one lasting three years. Two having been operated upon six years and three years previously, presented at this distant period a return in the pelvic lymphatic glands. Polaillon had one case which had remained well seven years; one, five years. Marchand one, seven years; one, five years. Schwartz one, four years (Bull. et Mem. Soc. Chir., 1888, p. 717 and foll., and M. Barraud, Complete or partial vaginal hysterectomy, Thesis, Paris, 1889, pp. 63 and 83).

‡ This opinion, of which I was one of the few defenders at the discussion that took place at the Surgical Society (Bull. et Mem., Oct., 1888, p. 770), at the present time reckons an increasing number of supporters.—Cf. Landau. Zur Diagnose und Therapie des Gebärmutterkrebses (Samml. Klin. Vortr., 1889, No. 338, p. 2419). Dmitri de Ott. Complete Extirpation of the uterus *per vaginam* (Ann. de gyn., Oct., 1889, vol. 32, p. 267).

Nevertheless the great authority of my illustrious master, Professor Verneuil, does not allow of my omitting a detailed account of the operative method that he recommends in such cases, for amputation of the infra-vaginal cervix by the linear écraseur.* In formulating it, he has taken particular pains to guard against its slipping, for, when applying the chain over the whole cervix, it has happened to him to cut too little or too much; once he opened Douglas' pouch and the patient died.

Infra-vaginal amputation of the cervix. Verneuil's method. First stage. Perforation of the cervix.—The patient being placed in the lithotomy position, an assistant takes charge of Sims' speculum, which depresses the fourchette. The cervix is lowered by means of Museux's forceps. Over the fore-finger introduced into the posterior cul-de-sac a trocar is glided, and is made to penetrate into the uterine tissue perpendicularly to the axis of the cervix. The Sims' speculum is pressed downwards, and the fore-finger carried into the anterior cul-de-sac, to keep guard over the point at which the trocar will make its exit, while the cervix is drawn downwards by the assistant. As soon as the canula of the trocar projects 1 cm. into the vagina, the stylet is withdrawn, and replaced by a small urethral bougie that projects into the anterior cul-de-sac, is seized with forceps and drawn down towards the vulva; the canula of the trocar is then removed.

After having attached to one end of the bougie two strong threads of about 50 cm. in length, the bougie is pulled through and there are left in position right across the cervix the two threads, the ends of which are at the vulva. One of these threads is for the purpose of passing the first chain, the other is to hold the uterus steady and gently draw it downwards. The fixation-forceps or hooks, which henceforth will be useless, are removed. If there be not to hand a curved trocar, the cervix can be easily perforated by means of the long and strong channelled sound (Broca's pattern), which is used for linear rectotomy. After having given it a suitable curve like that of Cooper's needle, it may be roughly sharpened to facilitate its

* Verneuil. Amputation of the cervix by means of the linear écraseur. Remarks upon the use of this instrument (Arch. gén. de Méd., Jan., Feb., 1884, 7th series, vol. 13, pp. 5 and 145).

passage across the cervix, and its open end may be wrapped round so as to form a kind of solid handle. When the point has reached into the anterior cul-de-sac, a flexible fine stylet is slipped through the channel, and serves to conduct across the cervix the two threads mentioned above.

Second stage. Introduction of the chains.—This stage presents no difficulty. Naturally care will be taken to turn the concave surface of the chain towards the cervix. The only precautions that must be taken consist, when the metal loop is drawn tight, first in well passing it at the sides beyond the limits of the disease when the ulceration approaches the lateral culs-de-sac of the vagina, and second, in placing the chain as nearly as possible perpendicular to the axis of the cervix. For that purpose it is necessary, when the loop of thread has been placed in position, to have the uterus drawn a little downwards, and to the opposite side to the chain, while the surgeon himself carries upwards the rigid stem of the écraseur, and especially to keep the constricting ring in position with the nail of the left fore-finger until it has traced its furrow in the tissue of the cervix. If the surgeon have two curved écraseurs at hand the chain of the second may be placed immediately after the first, and following the same instructions. The two instruments may then be kept going at the same time, which shortens the duration of the operation. If only one écraseur be obtainable the surgeon proceeds thus: before the first half is fully divided, the remaining thread is used to form a kind of a pedicle of the second half of the cervix. Then this half is tightly tied perpendicularly to its axis. When the first section is completed the uterus is drawn upon lightly by means of the two ends of the ligature, and the chain is placed in the sulcus formed by this ligature. Removal is then completed.

Third Stage. Division of the cervix.—This must be carried out very slowly if a perfectly exsanguine operation is desired. As soon as the chain has been drawn sufficiently tight to feel the resistance of the tissues the manœuvres are slowed down and the surgeon proceeds at the rate of one notch every 30 seconds. When a peculiar sound announces that the compressed tissue is being torn beneath the pressure, the interval between each stroke is further increased by 10 seconds. It is of essential importance to keep to this pace right up to the last notch under the penalty

of seeing the blood make its appearance during the last two or three minutes of the operation.

Dressing: after-treatment.—When the division is completed the portion removed is examined with extreme care to see whether the section has been through diseased tissue or has passed beyond it, and whether the peritoneum has escaped inclusion. If the peritoneum has not been injured the surgeon contents himself with giving a gentle vaginal douche of carbolic acid (2 per cent.) until the fluid returns colourless or only faintly tinged.

If the peritoneum has been wounded it would be prudent to insert a few stitches, although in some cases Nature alone undertakes the occlusion. If examination of the cut surface shows the persistence of some diseased spots upon the uterine stump in a case in which the surgeon cherished a hope of complete extirpation, he can, says Professor Verneuil, insert Lisfranc's speculum or the open boxwood speculum, and endeavour to destroy these last traces of the new growth with the cutting curette or the thermo-cautery.

The dressing is most simple. Verneuil places in front of the vulva a compress of antiseptic gauze, carbolised or impregnated with iodoform.*

Personally, I believe that complete hysterectomy is preferable to amputation of the cervix, even in cases where the cancer is very circumscribed. It alone gives a certainty of removing the whole disease. Moreover, the danger of hysterectomy is so greatly reduced that it does not differ sensibly from that of amputation of the cervix. However, I shall return to this point in more detail in the following paragraph.

II. *Cancer of the whole of the infra-vaginal cervix extending up to the level of the vaginal culs-de-sac exclusively.*—In these cases, if attention is directed to a partial operation, infra-vaginal amputation of the cervix is out of court, for above all things it is necessary to pass beyond the limits of the disease. It is, therefore, to a supra-vaginal excision, a true conical removal (similar to that which Huguier long ago applied to another affection) to which recourse has been had. Various surgeons have, independently of one another, practised an almost identical

* For the results obtained by Verneuil, see p. 30, note.

operation under various names. Koeberlé* "for nearly twenty years" has removed a conical portion with the bistoury, using a sound introduced into the cervix as a guide, and has then "burnt" with the thermo-cautery the tissues which retract. Baker† (of Boston) also speaks well of "high amputation of the cervix followed by cauterisation with a hot iron." E. van der Warker‡ performs a similar operation and then cauterises with chloride of zinc.

But it is Schröder§ who has done most to bring this method into general use, who has most clearly defined the indications

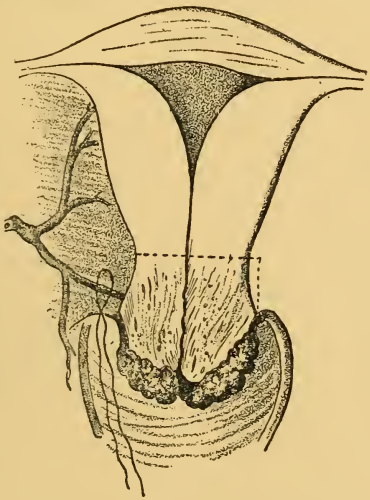

Fig. 186.—Supra-vaginal amputation of the cervix. Figure showing the extent of the excision, and the ligature of the lower branch of the uterine artery.

for its performance, and who has best described the technique under the name of supra-vaginal amputation of the cervix. According to him there is a fundamental difference between "cancroid of the infra-vaginal cervix" and the other forms of cancer; cancroid, he says, is a local affection having little or no tendency to spread to the body of the uterus if the cervix be freely removed at a distance of 1 to 1·5 cm. from the furthest

* Koeberlé. Treatment of cancer of the womb by hysterectomy (Gaz. hebd. de méd., Paris, Feb. 26, 1886, p. 139).

† W. H. Baker. Amer. Journ. of Obst., 1882, p. 265, and 1886, p. 184.

‡ E. van der Warker. Amer. Journ. of Obst., 1884, p. 225.

§ Schröder. Zeitschr. f. Geb. u. Gyn., 1879, vol. 3, p. 419, and 1881, vol. 6, p. 213.

limits of the disease. This operation would then be quite as effective, and according to Schröder and his pupils, less dangerous than hysterectomy.

The following is his description of the operation:*

The diseased cervix is lowered by means of Museux's forceps down to the vulva, and a loop of strong thread is passed across and above each lateral cul-de-sac (fig. 186). These threads serve to draw the parts down, moreover they may be utilised for compressing the uterine artery and its branches; when excision is completed they serve as the final ligatures at the base of the culs-de-sac. If absolutely unavoidable they may be done without.

Fig. 187.—Amputation of the cervix uteri.

A. Infra-vaginal amputation of the cervix; *oi*, internal os.—B. Supra-vaginal amputation of the cervix, track of the incision and of the subsequent suture; *oi* os internum.

An incision in the connective tissue should then be made in front of the edge of the anterior lip, and 1 cm. at least distant from the diseased tissues; the bladder is separated very easily from the anterior surface of the cervix over a sufficiently large extent by tearing through the loose connective tissue between them. The Museux's forceps are then raised so as to put the posterior cul-de-sac on the stretch, and the posterior wall of the vagina is incised as before. There is much greater difficulty in separating the peritoneum from the posterior vaginal wall. If.

* Schröder. Dis. of the female gen. organs. French trans. of 6th edition, p. 314.

by reason of the great extent of the new growth, the surgeon is obliged to carry his incision very high in the posterior cul-de-sac, he is quite likely to open the peritoneal cavity, and even when he has been able to avoid this danger, there is a great chance the very delicate serous membrane will be scratched in separating it from the vaginal tissue. The peritoneum is easily recognisable even before it has been cut into; it looks like a bluish and transparent bladder. If the serous cavity has been opened (and this is of slight importance if the operation be antiseptically performed) the tear or incision is closed by one or more stitches, and the ends of the sutures are cut off very short. The vagina being thus divided before and behind, the incisions are prolonged until they meet at the sides. The cervix freed by this circular incision is then detached from its connections by means of the finger, which tears through the parts and presses them on one side. The cervix is more difficult to liberate at the sides, where the cellular tissue is firmer, and large-sized arteries penetrate into the uterus. The vessels are tied and cut, and, if necessary, another ligature is put on them. When the cervix is judged to be sufficiently liberated, the anterior wall is cut into until the knife reaches the cervical canal. Then threads are passed across the anterior cul-de-sac and along the posterior wall of the bladder, traversing the anterior cervical wall and finishing by being brought through the cervical canal (fig. 187 B). The ends are tied, and thereby the section of the anterior vaginal wall applies itself to the section of the cervical mucous membrane; this suture, which takes in a considerable depth of tissue, also closes the wound of the connective tissue.

If at this time the posterior cervical wall be also divided, these stitches prevent the stump from returning to its proper position. Similar sutures are placed upon the posterior surface enclosing a considerable amount of tissue, and uniting the vaginal wall to the posterior part of the cervix. The junction is consolidated by placing additional stitches at the sides, and the operation is ended by closing all bleeding surfaces by sutures placed as deep as possible.

This operation allows of the certain removal of a large portion of the vaginal culs-de-sac (Schröder, on one occasion, removed at the same time the whole of the upper half of the vagina), the entire cervix, and even a small portion of the uterus itself.

Hofmeier has published the results of the practice of Schröder and some of his assistants from the beginning of 1879 to the end of 1884. It is the most important series known on the subject; 105 partial extirpations gave 10 deaths (or 9·5 per cent.) and excellent remote results.* In Germany, supra-vaginal amputation has also been performed by Gusserow,† in America by Baker and Reamy,‡ in England by Spencer Wells§ and Wallace,‖ and in France by Koeberlé,¶ Marchaud,** Buffet,†† Tédenat,‡‡ &c.

Collecting the series of Hofmeier, Gusserow, Baker, Reamy,

* Hofmeier. Berl. klin. Woch., 1886, No. 6, p. 91, and No. 7, p. 106.—With regard to the remote results the following is Hofmeier's return: seven times no information was obtainable; amongst the patients who had been operated upon at least a year previously, 43 had had a return of the growth and 45 had not; out of 83 women who had been operated upon more than two years previously, eight were dead, seven lost sight of, and amongst the rest were 37 returns of the growth and 31 cures, or 45·5 per cent. of cures. Of 49 women who had been operated upon at least three years previously, four were dead, six lost sight of, 26 had had a relapse, and 23 were cured, or 47 per cent. of cures.

† A. Gusserow (Die Neubildungen des Uterus, 1886, p. 233) had three deaths in 33 cases, or 9·9 per cent.

‡ W. H. Baker (Boston) (Amer. Journ. of Obst., 1882, p. 265, &c.; 1886, p. 484) performs a high operation by a method similar to that of Schröder, and follows it with a thorough application of the cautery. He reports ten cases without any death due to the operation. Their after-life was long; two relapses only after some months; one cure for two years, and then a relapse; one for four years; one for four years and seven months; one for five years; one for five years and three months; two for six years; one for eight years, and then a return of the growth.—Reamy (Amer. Journ. of Obst., 1888, vol. 21, p. 1028) has reported 57 high operations, followed by two deaths, due to the operation. In 29 patients the growth returned after a period varying from 1 to 14 years. The 26 others who had been operated upon from 1 to 15 years previously, appeared to be cured.

§ Spencer Wells (B. M. J., Dec., 1888, p. 1269) follows the high operation, performed with the knife and the scissors, by the application of the cautery at red heat. He had one death due to operation out of six cases.

‖ Wallace (B. M. J., Sept. 15, 1883) out of 10 cases had 2 deaths, or 20 per cent.

¶ Koeberlé (Gaz. hebd. de méd., Feb. 26, 1886, p. 139) prefers high excision of the cervix, followed by energetic cauterisation, to complete hysterectomy..

** Marchaud (Bull. et Mém. Soc. Chir., Oct., 1888, p. 832) has six times performed the supra-vaginal operation, and has had one death (peritonitis).

†† Buffet. Gaz. des hôp., 1886 (cited by Barraud); two operations, two immediate successes.

‡‡ Tédenat (cited by Barraud). One operation, one cure.—Collecting the operations performed by these three surgeons, which practically represent the balance-sheet of French surgery on this point for 1888, we find nine supra-vaginal amputations, one death resulting from the operation, or 11·11 per cent., a figure similar to that of foreign statistics. From the point of view of survival the following are the results: two women were lost sight of; two had early relapses; two were dead at the end of 11 and of 30 months; two were cured, one remaining so after three years, the other after four years (Barraud, *loc. cit.*, p. 74).

Spencer Wells, and Wallace, we have 221 high amputations of the cervix with 26 deaths, or a mortality of 11·7 per cent. Uniting those of Hofmeier and Baker, which are alone set forth in sufficient detail for this purpose, we have a series of recoveries two years after operation, which exceeds 50 per cent.! With Barraud, I think that this proportion is "really too good," and that it is in complete disagreement with the general prognosis of cancer. To my mind, these extraordinary series demonstrate in the clearest manner the numerous errors in diagnosis into which one may fall, although upon them has been based a condemnation of early hysterectomy.

But in spite of heated discussion in France and abroad surgeons are, in point of fact, far from agreeing upon the question whether partial amputation or complete extirpation is the operation to be preferred. It is probable that the opinion of the adversaries of the latter procedure will be considerably modified when it is clearly shown that complete hysterectomy is not to any sensible extent more serious than partial hysterotomy when it is performed under similar conditions. Now, this fact is at the present day almost perfectly shown. What casts a shadow over the older statistics is not only the inexperience of many of the operators, but also the radical interference for cases that really ought not to have been operated upon and the absence of any well-defined method of operation. Since these causes of failure have disappeared by experience and the progress of surgery the mortality in France has fallen to 5·88 per cent.* Nor has it undergone a less diminution abroad. Leopold† from 1883 to 1889 performed 80 vaginal hysterectomies for cancer with only four deaths, or a mortality of 5 per cent.; the last 52 cases of the series were followed by recovery. Dmitri de Ott (St. Petersburg)‡ has performed 30 operations without a single death; Schauta§ (Prague) has operated 65 times with five deaths, or 7·6 per

* Barraud (*loc. cit.*, p. 48) obtained the number of 5·88 per cent. as the mortality in a small series of 34 cases, representing the operations performed by Péan, Bouilly, Terrier, and Richelot in the year 1888.

† Münchmeyer. Congr. of Germ. gynæc. at Friburg, 1889 (Cent. f. Gyn., 1889, No. 31, p. 544). On a total of 160 vaginal hysterectomies for various affections from 1883 to 1889, Leopold had only a mortality of 5·4 per cent.

‡ Dmitri de Ott (St. Petersburg). Extirpation of the uterus *per vaginam*, &c. (Ann. de gyn., Oct. and Nov., 1889, vol. 32, pp. 241, 325).

§ Schauta. Centr. f. Gyn., 1890, p. 105 (supplement).

cent. Fritsch,* in a first series of 60 cases (1883-1887), had seven deaths. or 11·6 per cent.; his later series (1887 to November, 1889) comprises 41 cases with only two deaths, or a mortality of only 4·9 per cent. These examples are eloquent. They prove that by attacking cancer at its commencement, and by performing complete hysterectomy in those cases which other surgeons would make the subject of a partial operation, a mortality is obtained which does not exceed that of amputation of the cervix. And, personally, I feel bound to believe that hæmostasis and antisepsis can be much more easily carried out in complete hysterectomy than in supra-vaginal amputation; and, as a matter of fact, the last amputations of this kind in France and abroad have given a mortality of no less than 11 per cent. The great argument of the adversaries of early hysterectomy seems to me therefore to have almost completely fallen to the ground, and the value of the reasons that militate in favour of a radical intervention has in consequence considerably increased.

The chief of these reasons, to my mind, is the impossibility of asserting in the majority of cases that the disease is confined to the cervix and has not sent by the mucous membrane an ascending prolongation into the body of the uterus. Examination by the finger and the speculum are quite untrustworthy on this point, and may lead to cruel deception. I recently saw an example of this anatomical peculiarity which escaped the clinical examination. I had performed complete hysterectomy for an epithelioma that seemed perfectly confined to the lower portion of the infra-vaginal cervix, and for which, consequently, supra- or even infra-vaginal amputation of the cervix might have been looked upon as the legitimate operation. Now, in the extirpated organ it was easy to see a kind of line of new growth reaching right up to the fundus of the uterus by way of the mucous coat. Similar specimens have been described. A second, rarer, manner of this larval extension of cancer which cannot be diagnosed on the living patient, and which is only recognised in the removed organ, is the formation in the body of isolated

* Cf. A. Tannen. Beitrag zur Statistik, Prognose und Behandlung des Gebärmutterkrebses (Arch. f. Gyn., 1890, vol. 37, p. 434).—In his paper the author mentions 43 cases, from which I have had to deduct two cases of cancer of the body, which explains the difference in percentage.

metastatic nodules when there only exists a very small cancer of the cervix. Cases of this kind have been related by Binschwanger, Ruge, Schauta, Piering, Terrier, Stratz, Abel, Flaischlen,* and although of rare occurrence, cannot be neglected. I shall only mention the observations of Abel and Landau upon the serious changes in the mucous coat of the body accompanying epithelioid changes in the cervix. However, even if the sarcomatous nature of these lesions is not clearly proved in the future, it is none the less certain that they exist, and constitute a weak spot, a *locus minoris resistentiæ*, which is bound to favour return of the growth.

III. *Cancer of the cervix with invasion of the body but without any extension to the neighbouring tissues.*—For these cases there is scarcely any longer discussion, and the vast majority of gynæcologists agree in recommending total extirpation or hysterectomy through the vagina.

This operation, which can be called in one word colpo-hysterectomy, is relatively of old date,† and for a short time was quite the fashion fifty years ago. But it was recalled from oblivion, whither some formidable failures had relegated it, only quite recently by Czerny, after the dangers of complete extirpation through the abdominal walls (Freund's method, 1878; he led the way) had rendered it necessary to seek for another method. It was afterwards Demons of Bordeaux and J. Boeckel of Strasburg who re-introduced the operation into France.‡

Colpo-hysterectomy or vaginal hysterectomy.—Before operating

* O. Binschwanger. Centr. f. Gyn., 1879, No. 1, p. 6.—P. Ruge. Zeitschr. f. Geb. u. Gyn., 1886, vol. 12, p. 202.—Schauta. Prag. med. Woch., 1887, No. 28.—O. Piering. Zeitschr. f. Heilk., 1887, vol. 8, p. 335.—Terrier. Revue de Chir., May, 1888.—C. H. Stratz. Eine modification der Uterusexstirp. per vaginam (Centr. f. Gyn., 1888, No. 50, p. 817).—Karl Abel. Berl. Klin. Woch., 1889, No. 30, p. 675.—Flaischlen. Deutsche med. Woch., 1890, No. 30.

† Cf. for the history of the operation: Rochard. History of French surgery in the 19th century, pp. 265-267.—Ch. Gustave Hesse. The history of extirpation of the uterus (Rev. méd., 1827, vol. 2, p. 67).—Velpeau. New elements in operative medicine, Paris, 1839, vol. 4, p. 426.—Gomet. Vaginal hysterectomy in France, Thesis, Paris, 1886.

‡ Amongst the predecessors of contemporary surgeons it is right to note Sauter, of Constance, who performed the first vaginal extirpation of a not prolapsed cancerous uterus in 1822, and had an operative success, and Récamier who, in 1829, brought to a successful termination his first operation. Failures multiplied after this, and caused the abandonment of the operation, which could only be resuscitated with the antiseptic era of surgery.

Cf. on the early days of this resuscitation: Czerny. Ueber Ausrottung des Gebärmutterkrebses (Wien. med. Woch., 1879, Nos. 45 and 49).—Freund. Zur

the surgeon ascertains by careful examination that the uterus is movable, and that the broad ligaments are supple. To ascertain this, bi-manual palpation, rectal examination, lowering of the uterus with fixation-forceps are indispensable. Sometimes, in doubtful cases, to overcome reflex muscular contraction, to relax

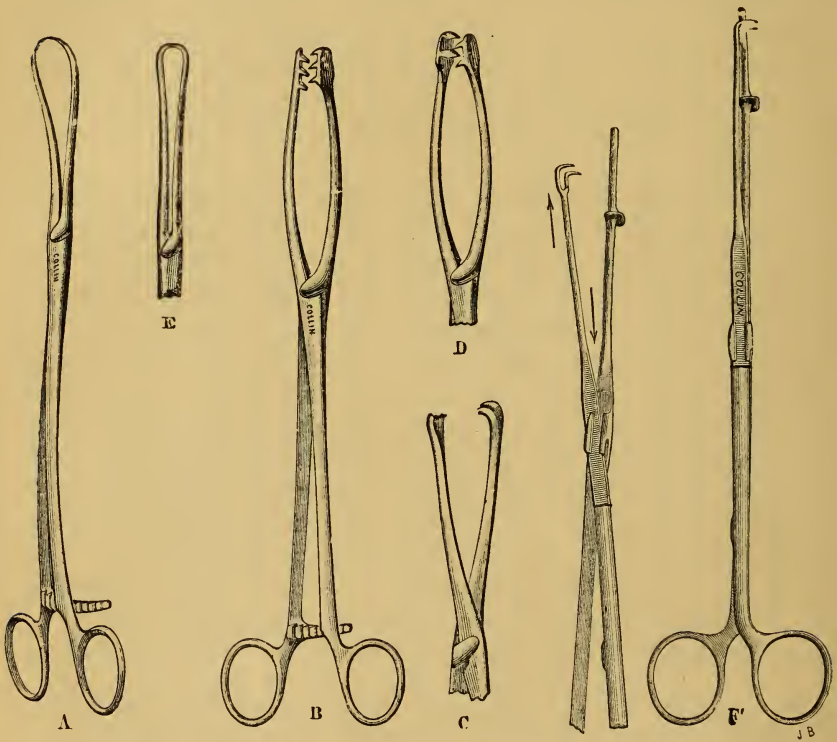

Fig. 188.—Forceps of various patterns for prehension of the cervix in hysterectomy.

A, E, fixation forceps. — B, D, forceps with square blades and toothed on their internal surface.—C, Collin's forceps with blunt hooks.—F, Collin's forceps with sliding hooks.—F', the same, closed.

the abdominal walls, or to overcome the extreme timidity of a nervous subject, it is advisable to make this preliminary examination with the assistance of chloroform.

Another preliminary precaution consists in disinfecting the

Totalexstirpation des Uterus (Zeitschr. f. Geb. und Gyn., 1881, vol. 6, p. 358).—Demons. Arch. gén. de méd., 1883, vol. 2, p. 257.—Jules Boeckel. Bull. et Mém. de la Soc. de Chir., June, 1884, p. 448.

vagina, so far as is possible, some days before the operation. If the cervix be covered with friable vegetations, giving rise to fœtid disintegration, it is necessary, a week before the date fixed for operation, to scrape the infra-vaginal cervix superficially (if necessary this minor operation can be followed for hæmostatic purposes by touching with a ten per cent. solution of chloride of zinc, or even with the actual cautery) so as to clear the field of

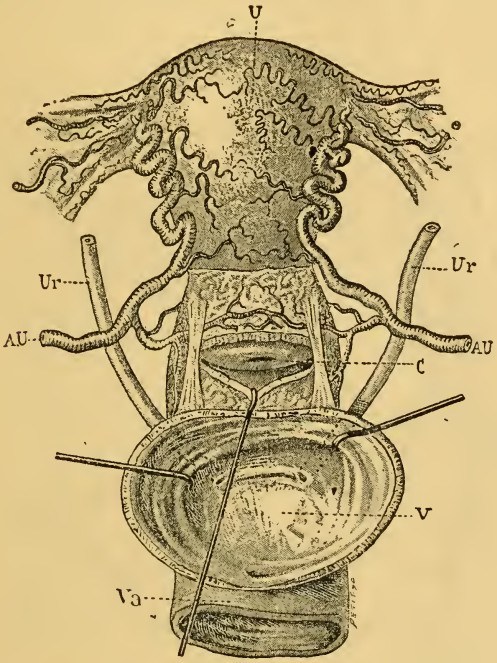

Fig. 189.—Relations of the ureters and the uterine arteries with the cervix.

U, uterus; Ur, ureter; A U, uterine artery; C, cervix uteri exposed by a transverse incision of the anterior vaginal cul-de-sac; V, bladder cut across at the level of the entrance of the ureters into its walls; Va, vagina. Two bundles of fibrous tissue unite it to the cervix laterally; on the latter can be seen the portion not covered by peritoneum, to which the bladder was adherent before the dissection was made.

operation and to prevent its infection. It is not necessary to anæsthetise the patient for this small operation, as it is almost painless. Large sublimate irrigations (1 in 5,000) twice a day, and the application of iodoform tampons in the interval complete the preliminary arrangements. The patient is to have her bowels opened the evening before the operation; three hours before the

operation she is to be given a full simple enema, and immediately before commencing, an assistant who is not going to take any direct part in the hysterectomy is to assure himself by rectal examination that the large bowel is quite empty; if it be not so, he must immediately give injections of warm water, which, aided by the finger, will remove all fæcal matters; this cleansing is to be followed by a rectal irrigation of a 3 per cent. solution of boracic acid. Immediately before the operation the catheter must be passed by an assistant.

The patient anæsthetised is then placed in the dorso-sacral

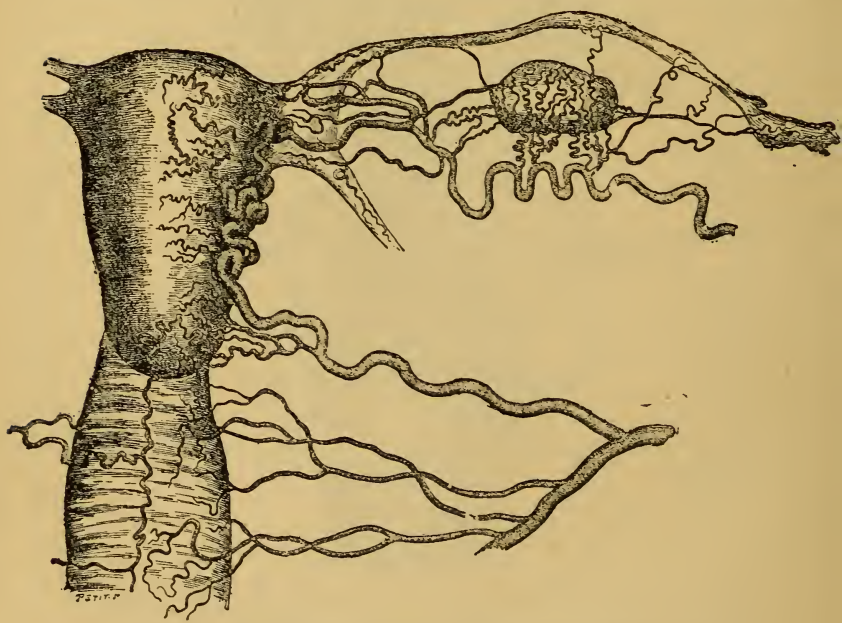

Fig. 190.—Vessels of the uterus; uterine and utero-ovarian arteries.

position, and an assistant on each side holds the flexed thigh under one of his arms, while the other is left quite free to render any assistance. The fourchette is depressed by means of a retractor, and the sides stretched outwards as much as possible. The cervix is seized with Museux's forceps, or any other prehension-forceps (fig. 188), and continuous irrigation is gently commenced upon the field of operation (fig. 11).

First stage. Opening of Douglas' pouch and suture of the vagina and peritoneum.—The surgeon then draws the cervix very

strongly forward, so as to put the posterior cul-de-sac on the stretch, and this he incises over its whole length right up to the peritoneum.

The fore-finger of the left hand is inserted into this button-hole, and by means of a very curved needle a series of layers of stitches is put in over the whole extent of the vaginal incision, and comprising the whole thickness of the tissues right up to and including the peritoneum. By proceeding thus, and following Martin's example,* the vaginal vessels, which are often a

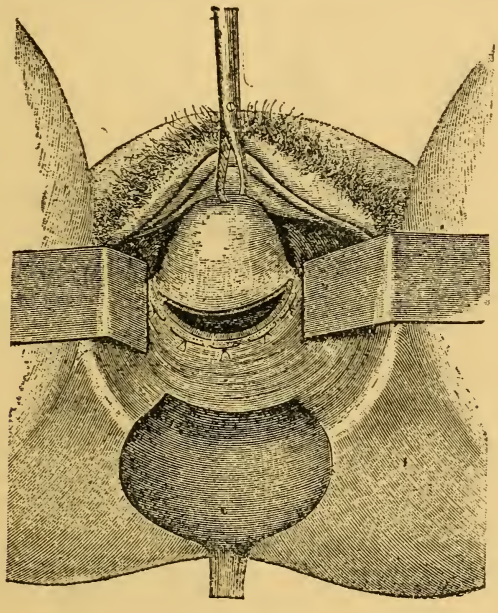

Fig. 191.—Vaginal hysterectomy.

Stage 1. Opening of the posterior cul-de-sac and suture of the vagina (after Martin).

cause of persistent, and consequently inconvenient, hæmorrhage, are firmly secured, and moreover the cellular interstices are closed, and separation of them in the later steps of the operation is prevented (fig. 191).

It may happen that the vagina is inserted into the cervix posteriorly, very high up, or that Douglas' pouch has been in part filled up by adhesions. The dissection then must be carried

* Martin. Path. u. Ther. der Frauenkr., p. 368.

out very slowly, and it may be advantageous to put in two superposed layers of stitches.

Second stage. Hæmostatic suture of the pelvic roof.—The needle is now changed for a longer, stronger, and less curved one (Deschamps' needles, pointed, are the best for this special purpose). With it, on each side of the button-hole incision, are placed two large stitches, taking in their entirety the posterior portion of the lateral culs-de-sac of the vagina, and going deeply enough to embrace at the base of the broad ligaments the trunk of the uterine artery, or at any rate its lower branches. For this

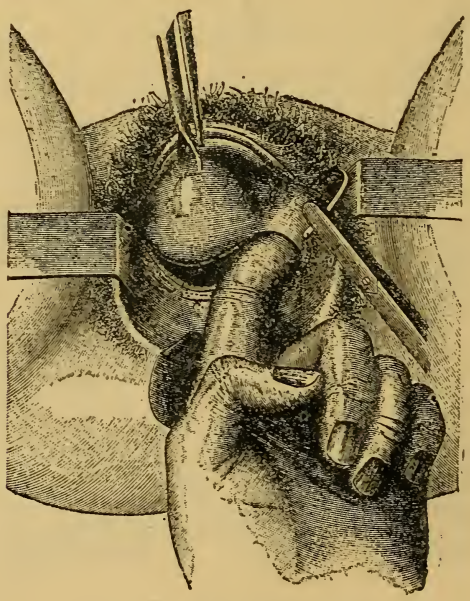

Fig. 192.—Vaginal hysterectomy.
Stage 2. Suture of the pelvic roof (after Martin).

purpose it is necessary to place the fore-finger in one of the angles of the button-hole, and strongly draw downwards and forwards the base of the broad ligament, which is, so to speak, carried in front of the point of the needle (fig. 192).

The needle is inserted at a point 2 cm. distant from the angles of the wound, and is pushed onwards (if it be not a Deschamps' needle) until the fore-finger feels its point, when it is seized by a needle carrier; it is drawn downwards and brought out 1 cm.

from its entrance point so as to enclose about 1 cm. of the lateral cul-de-sac of the vagina. Very strong silk must be used for this ligature, and it must be drawn very tight. One or two additional stitches are put in on each side, in front of the first and nearer the cervix. In this way all the vessels will be found to be obliterated on the vaginal side before the first step in the operation has been concluded. There is no fear for the ureter, it is situated further forward, and moreover is very high up, by reason of the considerable traction exerted upon the cervix by the lowering of the organ.

Third stage. Complete circular incision of the vagina; separation from the bladder.—The cervix is now carried backwards, so as to put the anterior cul-de-sac on the stretch. A circular incision of the vagina is completed; great care must be taken in front, to keep as close as possible to the cervix, while keeping a sufficient distance from the diseased tissues, otherwise there is a risk of wounding the ureter; for the same reason the cutting edge of the knife must always be directed more or less obliquely towards the cervix. As soon as the incision of the vagina is completed, the knife is laid on one side, and the finger proceeds to separate the bladder; it is only rarely that scissors can be used. The surgeon must remember that the extent and resistance of the vesico-vaginal partition is very variable in different subjects. After going a short distance the finger finds a lack of resistance, which shows that it has reached the end of the attachment of the bladder; the peritoneal cul-de-sac may then be seen and recognised by its bluish appearance. Many surgeons incise the peritoneum at once, but I prefer the opposite course, so that the uterus, when it is put on the swing, may not carry the ulcerated surface of the cervix into the peritoneum. The operation must not be further proceeded with until the hæmorrhage, which may then appear, though generally only very slight, has been arrested by stitches placed in this second button-hole incision.

Fourth stage. Backward displacement of the uterus; ligature of the broad ligaments.—The cervix is thoroughly liberated up to its upper portion. It is then drawn forwards, the posterior portion of the wound is depressed with a retractor, and by means of a curved pair of Museux's forceps, the fundus of the uterus is seized behind and brought into the wound, the forceps fixing the cervix having been previously removed.

Sometimes difficulty is met with in the endeavour to bring the uterus into the wound; that depends, as a rule, upon an insufficient liberation of the cervix, and this preliminary stage that the ligatures of the pelvic roof will have rendered bloodless* must be immediately completed.

As soon as the uterus is turned upside down the upper portion of the broad ligaments with its expansions is situated below, and the base of these ligaments above. It is then to be tied in three portions, and then there will be no need of interlacing the threads to make a chain ligature. The ligaments are first sutured and divided on the left side. Before completely detaching the uterus a stitch is put in uniting the last portion of the ligatured broad ligament to the angle of the vaginal wound. The same procedure is carried out on the left side, and this stage is completed by dividing the last bonds that retain the uterus, and in particular the anterior peritoneal reflexion, which has been kept intact (if possible) to oppose a barrier to the infection that would be caused by the inverted cervix. The wound is then carefully cleaned up with small antiseptic cotton-wool tampons.

Fifth stage. Drainage and dressing.—A stitch placed at each commissure of the vaginal wound draws it sufficiently close without closing it entirely. Before tying these sutures, I place in Douglas' pouch, to serve for drainage, a strip of iodoform-gauze doubled at its upper extremity, the two ends of which are afterwards rolled up in the vagina, and made recognisable by a thread that is attached to them for the purpose. Other strips very loosely rolled up complete the dressing. These latter are replaced at the end of a variable time, according to the abundance of the sero-sanguinous oozing, but the strip thrust up into Douglas' pouch is left *in situ*, and by its capillarity serves as drainage, nor should it be removed till six or eight days have elapsed.

I greatly prefer this method of draining to the india-rubber cross-tube that is used by Martin, to the glass tube of many

* Various instruments have been invented to facilitate this displacement of the uterus. Martin has used a kind of large sound introduced into its cavity; Quénu a crotchet with two hidden and opening blades. I believe these instruments are neither free from inconveniences nor from risks. If the uterus cannot be inverted easily, in spite of liberation of the cervix, in consequence of the presence of a fibroid, adhesions, or any other cause, it is much better to draw it directly downwards, and ligature the broad ligaments *in situ*.

English operators, and to the double-barrelled tube of certain French surgeons.* As to the complete closing of the wound, such as Mikulicz recommended at the Berlin Surgical Congress in 1881, it has at the present time few supporters, and rightly so. Nevertheless the method is adopted by Hegar and Kaltenbach.†

Ought the appendages to be removed or not? If the ovaries and tubes fall into the wound removal is absolutely necessary, but if the surgeon has to go in search of them, I think the indications are different according to whether the woman menstruates or has passed the menopause; in the first case, the surgeon is bound to remove organs whose functions might at least persist for some time (for removal of the uterus does not always lead to their atrophy) and give rise to accidents, as has been seen.‡ He should then quickly go in search of the appendages, the removal of which will be, as a rule, easy. If any difficulty be experienced by reason of adhesions, &c., time should not be wasted over this complementary part of the operation, for it would be much better to run the risk of some ulterior accidents, which are usually slight, than to complicate the operation. Brennecke has come to the conclusion that removal of the appendages is a matter of small consequence, as they very soon undergo atrophy. But this last assertion is controvertible; the experiments of Grammatikati and the observations of Glœvecke seem to indicate that ovulation continues, but that it is tolerated by the peritoneum.

The latter part of the treatment is very simple. If the iodoform tampons have not become too much saturated with

* Krugenberg has published a case of death occurring on the seventh day from twisting of a loop of intestine around a drainage tube that penetrated into the peritoneal cavity (Niederrheinische Gessellsch. in Bonn.—Centr. f. Gyn., 1887, No. 37, p. 595).

† Hegar and Kaltenbach. Die oper. Gynäk., 3rd edit., 1886, p. 446.

‡ In a case of W. Duncan's in which he had not removed the ovaries, there were three very sharp attacks of pain that corresponded exactly with the menstrual epochs, showing indubitably ovulation with circumscribed peritonitis; as, after this, similar accidents did not occur, the author thinks that the ovary must have undergone fibrotic change.—The same accidents occurred in a patient who had been operated on by Sir W. Mac-Cormac, according to Duncan. Trans. Obst. Soc. Lond., 1885, vol. 27, p. 29.—Schröder also in some rare cases witnessed attacks of pain at the menstrual epochs.

§ Grammatikati. Centr. f. Gyn., 1887, No. 7, p. 105.—Glaevecke, Arch. f. Gyn. 1889, vol. 35, part 1, p. 1.

blood, one may leave them in their place for four days. They have then to be renewed, and at the end of the first week they are taken away with the strip which acted as a drain; the false membranes, one will then find, have been forming a barrier in the peritoneal wound for some time past. All the same the greatest precautions will be necessary during the vaginal douches; they should not begin before eight days, under very weak pressure, 1 in 5000 sublimate solution being used, and the fourchette being kept well depressed. The patient may be allowed to get up at the end of three weeks,* and that is the time to look for the deep sutures placed in the vagina. It generally takes two or three sittings, with a few days' interval, to get them all away. Some inconvenience would be caused by leaving them, because their elimination (which in the end would occur spontaneously) would provoke some irritation and leucorrhœa.

For the first twenty-four hours the patient is put on low diet, and in case of any sickness produced by the chloroform she is allowed nothing but some ice. I am in the habit of giving an enema on the third day.

The cure may be completed without any rise of temperature.

I have described the method of operating which I have adopted; it is almost the same as A. Martin's. I shall now, by way of appendix, make mention of the principal modifications in the methods of operating which have attached to them any names of well-known surgeons.

First, second, and third steps of the operation.—Fritsch† begins with a sort of dissection of the lateral culs-de-sac, and searches for the uterine arteries, which he incises and ligatures. He then dissects the bladder, and finishes by cutting into Douglas' pouch.

Olshausen ‡ waits till the last moment before opening this pouch, for fear of infecting the peritoneum.

Schatz § only deals with the detachment of the bladder

* S. Gottschalk (Die Nachbehandlung der vaginalen Totalexstirpation, Centr. f. Gyn., 1870, p. 443) believes that the time the patient has to spend in bed should vary according to her constitution, and not be systematically fixed at fourteen days according to Fritsch's practice, or ten days according to Martin.

† Fritsch. Centr. f. Gyn., 1883, No. 37, p. 585.

‡ R. Olshausen. Klin. Beitr. zur Gyn. u. Geb., Stuttgard, 1884, p. 105.

§ Fried. Schatz. Arch. f. Gyn., 1883, vol. 21, part 3, p. 409.

towards the end. Saenger and various authors have recommended dividing the vaginal culs-de-sac by means of the thermo-cautery (this renders the dissection difficult, and does not present any real utility).

To prevent the hæmorrhage which occurs from the ulcerated surface of the cervix, Fritsch dissects it and then places an elastic ligature round its base.

Müller has the abdominal aorta compressed during the operation.

It has been recommended in cases of excessive narrowness of the vagina or vulva (hymen, senile atrophy, circular bands, &c.), to make incisions into the perinæum, and even into the vagina, sewing them up afterwards. I have, in a few cases, found them of the greatest advantage.

To seize the cervix, which tears so readily, several kinds of forceps have been invented. Brennecke * has invented an ingenious instrument which has to be passed closed fairly high up into the cervix, when its hooks are made to spring out and fix themselves into healthy tissue, which they do not run the risk of tearing. The forceps, with the whole of the blades meeting in apposition, as recommended by Museux, and a pair of bullet extractors, seem to me to be sufficient, so long as they are quickly passed beyond the point of circumcision in the vagina.

In difficult cases Müller,† after applying provisional ligatures *en masse* round the broad ligaments, divides the uterus in the middle and proceeds to remove each half. Other authors take it away in several pieces. These methods expose the wound to the risk of infection.

Fourth step of the operation.—The uterus is not thrown backwards by Billroth, Leopold, Olshausen, &c., who are content with dragging upon it forcibly and loosening it little by little. They find fault with the method of throwing the uterus backwards, because it is likely to infect the wound. But this danger is almost entirely suppressed if the cervix has been scraped and disinfected several days beforehand, and if the anterior cul-de-sac

* Brennecke. Zur Technik der vaginalen Uterusexstirpation (Centr. f. Gyn., 1883, p. 763).

† C. J. Müller. Ueber die Exstirpatio uteri vaginalis (Deutsche med. Woch., 1881, Nos. 10 and 11, pp. 122 and 142, and Centr. f. Gyn., 1882, No. 8, p. 113).

of the peritoneum is maintained as a barrier in front of the cervix until the end of the operation.

Czerni, Fritsch, Demons, throw the uterus forwards, a manœuvre which is greatly facilitated by the frequent presence of antiflexion, and the fact that the resistance of the round ligaments has not to be got over.

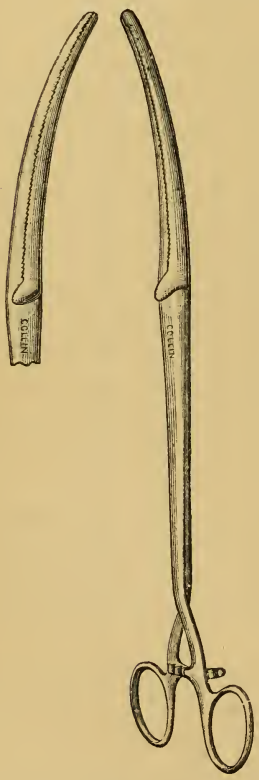

Fig. 193.—Forceps curved on the side for forcipressure of the broad ligaments in vaginal hysterectomy (Péan and Richelot).

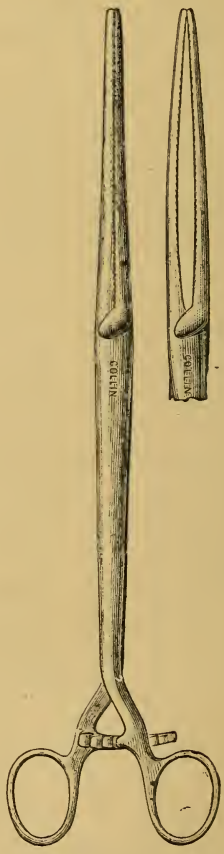

Fig. 194.—Arched forceps, for the broad ligaments in vaginal hysterectomy (Doyen).

Martin and Schröder throw the uterus backwards. I have already said that Martin, in difficult cases, introduces for this purpose a sort of mandrel into the uterine cavity, and that Quénu has proposed a special sort of hook.

For stopping the bleeding in the broad ligaments, Olshausen employs the elastic ligature; he makes a button-hole in the peritoneum between the uterus and the bladder with Cooper's probe-pointed bistoury, and passes the elastic ligature by means of one of Deschamps' needles.

Hegar and Kaltenbach* recommend the elastic ligature *en masse* for the broad ligaments, but only as a temporary means, and they insure the perfect hæmostasis by means of partial liga-

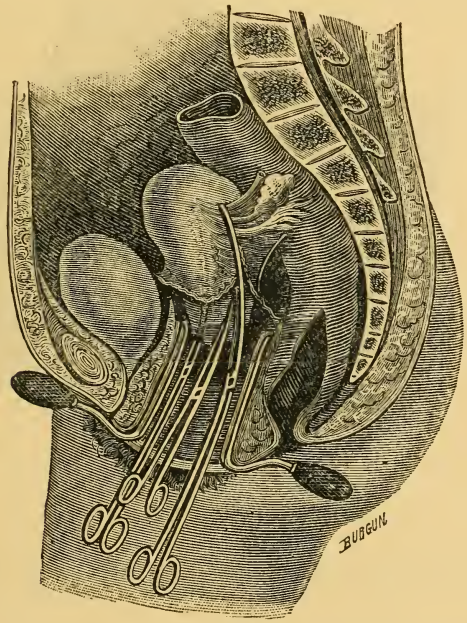

Fig. 195.—Vaginal hysterectomy. Compression and section of the base of the broad ligament (Péan).

tures with silk as soon as the uterus has been detached; this complication seems to us quite useless.

Demons uses catgut ligatures, which to me appear insufficient on account of the difficulty of tying the catgut tightly enough.

Le Dentu has suggested the use of a special kind of needle for the ligature of the first broad ligament.

The use of metallic wires for ligaturing the broad ligaments had been suggested (theoretically) by Coudereau. Schröder and Olshausen took up the idea for a time, but soon abandoned it.

* Hegar and Kaltenbach. *Loc. cit.*, 3rd edit., p. 445.

C. E. Jennings* places a provisional ligature *en masse* upon the broad ligament with a skein of carbolised silk, which is held tight by squeezing a perforated lead shot upon it; afterwards he places some ligatures or some fixation forceps. Péan has the broad ligaments compressed in any cases where the ligaturing of the vessels happens to be a tedious matter. Richelot has

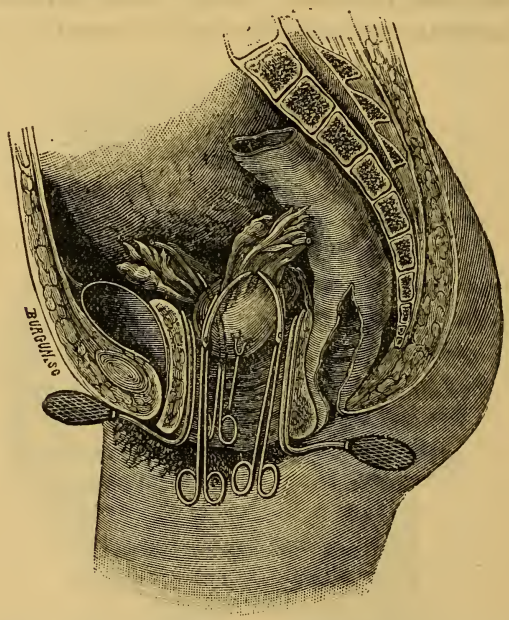

Fig. 196.—Vaginal hysterectomy. Compression of the upper border of the broad ligament, after the uterus has been tilted (Péan).

brought the fixation forceps into general use for all cases indiscriminately.†

* C. E. Jennings. On excision of the entire uterus for cancer (Lancet, 1886, Nos. 15 and 16, pp. 682 and 825).

† The first idea of the constantly employing and choosing the long forceps and leaving them fixed in the broad ligaments for two or three days belongs, at least as far as the publication is concerned, to Spencer Wells (Ovarian and uterine tumours. London, 1882, p. 526), who proposed it systematically as early as 1882. His pupil, C. E. Jennings, meeting with some difficulty during an operation, remembered merely the rules laid down by his master, which had just recently been discussed by A. Duncan (Jan. 1885) at the Obst. Soc. of London, and (on the 30th Oct., 1885) he applied Spencer Wells' long forceps and left it *in situ;* a cure took place (the case was published in March, 1886).—In Nov., 1885, Richelot (Bull. et Mém. de la Soc. de chir., Nov. 1885, p. 749) again brought before the Société de chirurgie of Paris the theory proposed by Spencer Wells, and, on the 28th of April, 1886, he put his

Forceps of various kinds have been suggested: Spencer Wells' long forceps, Péan-Richelot's curved forceps (fig. 193), Doléris' forceps, which can be taken to pieces, Doyen's forceps (fig. 194) with arched blades, which only act by their extremities, Polk's clamp-forceps, &c.* A large number of surgeons, especially in France, have adopted this method of operating, which seems to me to have several drawbacks, the principal of which are: the absence of security as regards the bleeding, the risk of damaging the bladder, ureter, intestine, and lastly, the extreme difficulty of insuring perfect antisepsis.†

Fifth step.—With the object of preventing a recurrence by freely removing any tissues where it might take place, it has been proposed to terminate hysterectomy by the resection of the neighbouring portion of the vagina, or even by the removal of the broad ligaments. Richelot‡ recommends the former, even when the vaginal wall seems healthy, as a supplement to the operation, involving no great difficulty. Pawlik,§ still more bold, extirpates the parametrium after having previously placed sounds in the ureters to enable one to recognise and avoid them. He has operated three times in this manner, but the later efforts have not been published. It is doubtful whether these modifi-

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proposal into execution (Commun. à l'Acad. de méd., July 13, 1886, and Union méd., July, 1886), and he described it as a method to be chosen, applicable to every case. Péan, who claimed the honour of first putting it into practice, and who is apparently the first who made its use common, on account of the publicity he gave for a long time to the pressure of the vessels, only published his facts in 1886 in Gomet's thesis, On vaginal hysterectomy in France, Paris, 1886.—Buffet, of Elbeuf (Gaz. des Hôp., 1886, No. 116), has recorded a case, dated June 19, 1885, where Péan made use of forcipressure out of necessity in a case of hysterectomy done for a myxo-sarcoma. The originality of Richelot's method consists in the systematic use of forceps in preference to ligatures, even in cases where the latter could be easily used.

For the question of priority raised between Péan and Richelot relating to the use of pressure applied to the broad ligaments, see Péan, Reports of the French Congr. of Surg., 1886, p. 388.—Richelot. New Arch. of obstet. and gyn., Oct. 25, 1889, p. 449.

* R. de Madec. Surgical treatment of cancer of the uterus, Thesis, Paris, 1887.—Doléris. Nouv. Arch. d'obst. et de gyn., 1887, p. 11.—Doyen. New forceps for the broad ligaments (Bull. et Mém. Soc. de chir., March, 1887, p. 163.—Polk. Transact. of the Obstetr. Soc. of New York (Amer. Journ. of Obstet., March, 1888, p. 302).

† For critique of this method, see Demons. Reports of the Fr. Congr. of Surg., 3rd sess., 1888, p. 372.—S. Pozzi, ditto, and Indicat. and techn. of vaginal hysterectomy for cancer (Annal. de gyn., Aug., 1888, p. 81).

‡ Richelot. Bull. et Mém. Soc. de chir., Dec. 29, 1886, pp. 946 and 952.

§ C. Pawlik. Centr. f. Gyn., 1890, No. 1, p. 22.

cations are of any use, and it is certain that they are more or less dangerous.

The question of drainage has not been definitely settled. In France most operators leave the wound open and place one or two caoutchouc tubes in it. In England, glass tubes are very much used. Martin employs a cross-shaped caoutchouc tube, which has the advantage of keeping in its place very easily. He withdraws it on the third or fourth day. But in Germany there seems to be a tendency to suture the vaginal wound. Kaltenbach, Mikulicz, Tauffer, v. Teuffel, Schede, &c., are all in favour of it. Czerny and Fritsch, however, discard sutures. I believe, as do Demons, Terrier, Bouilly, and almost all the French surgeons, that it is more prudent not to close it entirely, but merely to make the wound somewhat smaller. The sero-sanguineous flow, which frequently takes place during the first few hours, proves that it is a useful precaution, for in spite of all the means adopted the seat of operation may be infected by the contact of the cancerous products.

The sub-peritoneal decortification of the uterus, which formerly constituted Mr. Langenbeck's method (he operated thus in 1813 upon a prolapsed uterus) has been taken up again by a few authors, Lane* and Frank† among others. It is merely a useless complication added to the method.

Complications during operation.—I have already spoken of hæmorrhage, and the means of avoiding it.

The ureter has occasionally been injured by the knife, the ligature, or the points of a forceps; it is one of the great dangers of forcipressure. This accident has been caused by the forceps in the hands of various distinguished surgeons,‡ which is a good proof that more blame should be attached to the method than to the surgeon. When the result is not fatal, what follows is a fistula of the ureter.

To avoid wounding or tying the ureter, one should keep very close to the cervix, anteriorly, as I have indicated; besides, one should only start throwing back the uterus after having dis-

* Lane. San Francisco Pacif. med. and surg. Journ., April, 1880.

† Frank. Ueber extraperitoneale uterusexstirpation (Arch. f. Gyn., 1887, vol. 30, p. 1).

‡ J. Boeckel. Bull. et Mém. de la Soc. de Chir., June, 1884, p. 448.—Richelot de Madec, *loc. cit.*, p. 80.—Lannelongue (of Bordeaux), quoted by Demons. Fr. Congr. of Surg., 3rd year, 1888, p. 373.

engaged the cervix as far as its upper limit. Last of all, it is better to abstain from placing long forceps very deeply on the broad ligament.*

The bladder has been opened by the knife, and even ruptured by the fingers during the detachment of the uterus. This accident is almost unavoidable if one operates on cancers spreading anteriorly (which is a contra-indication for operating). One should never omit to pass a catheter when the woman is on the operating table to empty the bladder and make it less accessible.

When the bladder happens to get cut or torn, one should immediately suture it; such lesions have then been sometimes seen to heal without any fistula, and should this occur, it could be easily cured later on. In any case, a soft catheter would have to be tied in for several days.

The rectum can only be opened through the operator's fault, unless involved in the disease, in which case a radical operation would do more harm than good. It has been injured by fixation forceps,† either through the teeth seizing it, or through their producing a slough by pressure in its neighbourhood.

The mortality following this operation has considerably decreased during the last few years. In 1884, F. Brunner,‡ giving an account in his introductory lecture of the cases published up till then, had found before 1877, 33 cases with a death rate of 82 per 100, and after 1877 till February, 1884, 146 cases with a death-rate of 32·9 per 100. Mundé,§ amongst 255 cases collected in the two worlds after 1879 (the date on which Czerny published his method of operating) until 1884, found 72 deaths, that is, 28·2 per 100. W. A. Duncan,‖ out of 276 operations, collected to the beginning of 1885, found 79 deaths, that is, 28·6 per 100. Hache,¶ who took advantage of

* Some authors (J. Boeckel, &c., and myself) have, as a means of avoiding the fistula of the ureter following hysterectomy, performed nephrectomy; one can also, like Kaltenbach, make a large communication between the vagina and the bladder, and then close the inferior part of the vagina by the operation known as kolpokleisis.

† Duplouy (of Rochefort). Congr. franç. de chir., 1886, p. 391.—Küsher, mentioned in Union méd., March, 1886.—Vrobleski, Union med., Oct. 18, 1888 (reference was here made to a hysterectomy for a non-cancerous uterus).

‡ F. Brunner. Ueber die Exstirpation des Uterus von der Scheide aus. Thesis for Zurich, 1884.

§ Mundé. Amer. gyn. Assoc. (Gyn. Trans., 1884, vol. 9).

‖ W. A. Duncan. On extirpation of the entire uterus (Trans. of the Obstet. Soc., London, 1885, vol. 27, p. 26).

¶ M. Hache. De l'hystérectomie vaginale pour cancer (Revue des sciences méd., 1887, vol. 29, p. 724).

the important tables of Sarah Post,* and added to them until the beginning of 1887, gives for that period a mortality of 24·47 per 100.

These documents at the present day possess nothing but historical interest. If one wants now to estimate the mortality after colpo-hysterectomy for cancer, one must eliminate the old data and keep only to those of the last few years, since the method of proceeding has been improved, and the operators have gained greater experience. It is also quite fair not to take into account, for forming a correct opinion on the subject, the numerous isolated cases published by surgeons who are more or less inexperienced or incompetent. W. A. Duncan, on obtaining the statistics of 276 cases (at the commencement of 1885) done by 71 surgeons, pointed out the fact that 35 of these surgeons had only performed hysterectomy once. There is therefore, as one sees, a great risk with such figures, of getting the mortality inherent to the operators and not to the operation itself. The rule given by Lawson Tait seems reasonable enough; it consists in only dealing with results obtained in the practice of those surgeons whose ability and experience are affirmed. It is thus that we should judge of every new operation.

A. Martin† applied to some surgeons who fulfilled these two conditions, and he received the whole list of the cases in their practice up to 1886. It is as follows:—

Fritsch ...	60	operations with	7	deaths (*i.e.*, 10·1 per 100)	
Leopold ...	42	,, ,,	4	,, (*i.e.*, 6·0	,,)
Olshausen ...	47	,, ,,	12	,,	
Schröder and Hofmeier	74	,, ,,	12	,,	
Staude ...	22	,, ,,	1	,,	
A. Martin ...	66	,, ,,	11	,,	
	311		47	(about 15·1 per 100).	

But as I have already said, these results, although recent, are even yet too old, and have been far surpassed. The last statistics which I have mentioned bring the actual rate of mortality down to about 5 per 100. I have already made mention of

* Sarah E. Post. Kolpohysterectomy for cancer (Amer. Journ. of med. sciences, 1886, vol. 91, p. 113).

† A. Martin. Transactions of the international med. congress, Sept., 1887 (Amer. Journ. of Obstet, Oct., 1887, p. 1108).

Leopold's* series of 80 operations with only 4 deaths, that is, 5 per 100; that of Kaltenbach† consists of 53 hysterectomies for cancer of the cervix with 2 deaths, that is, less than 4 per 100; that of D. de Ott‡ is still more favourable, and one finds no death in 30 cases operated upon. The same may be said of a series of 25 successful cases in the hands of Péan.§ After these figures there seems no need to have a lengthy discussion on the application of this operation to all cases where cancer has been diagnosed. No one will deny that one will thus be much more likely to obtain a radical cure. Therefore, why deny oneself the advantage to be got from it since it has become as safe as a partial operation?

There is, however, amongst many surgeons a reaction taking place to-day against amputation of the cervix in cases of cancer. Schatz, Gusserow, Martin, Kaltenbach, Sänger, Fritsch, Christian Fenger, Bouilly, Terrier, P. Segond, &c., are very decided in their opinions on the subject. I also believe that the operation should be done as soon as the cancer is diagnosed for certain. It is the reason for my having written‖ (without always being understood¶), "The narrower the limits of the disease, the wider should the operation be." If one removes the whole uterus at the very beginning, one is certain to leave none of the disease behind, and there is a chance of avoiding any congestion of the ganglions, and any invasion of the neighbouring tissues. Should this have already happened, one can but resort to partial destruction or some palliative treatment. On the whole, one has merely to apply the rules recognised for the treatment of external cancers in general.

Causes of death after vaginal hysterectomy.—They can be grouped under three principal headings: hæmorrhage, shock from the operation, septicæmia.

Hæmorrhage may come on either during or after the operation. Hæmorrhage, in the first instance, is always the result of some

* Leopold, after F. Münchmeyer. Ueber die Endergebnisse, &c. (Arch. f. Gyn., 1889, vol. 36, No. 3, p. 424).

† R. Kaltenbach. Berlin klin. Woch., 1889, Nos. 18 and 19, pp. 389 and 417.

‡ D. de Ott. Annal. de Gyn., Oct.-Nov. 1889, pp. 241 and 325.

§ Péan. Communication to Sécheyron, Treatise on hysterotomy, 1889, p. 542 (see note).

‖ S. Pozzi. Indications for and method of performing vaginal hysterectomy for cancer (Annal. de Gyn., Aug.-Sep., 1888, vol. 30, pp. 81, 179).

¶ M. Barraud. *Loc. cit.*, p. 6.

fault in the operation; it may be avoided for certain by tying the tissues as one goes along in small lumps before dividing them. One should carefully avoid ever pulling upon a suture which has been tied, and one should therefore cut the threads at once instead of putting off doing so till the end of the operation. The use of ligatures put in in stages is less likely to be followed by hæmorrhage than the use of the hæmostatic forceps; if a ligature gives way only one or two vessels bleed; if the tissues escape from the grasp of a long pair of forceps the greater part of them begin bleeding, at times even the whole broad ligament begins oozing and becomes retracted to a great depth. Death has thus resulted several times after the systematic use of the forceps. I shall merely mention that of Richelot's,* which occurred in Professor Verneuil's wards, and a case which I myself witnessed, but which has not been published.

Secondary hæmorrhage, or rather continuous hæmorrhage, has been observed after the removal of cancers which had invaded the tissues surrounding the uterus, and where all had not been removed.

In the case of secondary hæmorrhage, which is really a rare accident, one might introduce an antiseptic tampon into the vagina made of iodoform and resin gauze, supposing the loss of blood is not very great; and when it happens to be alarming, one should go in search of the bleeding vessel, and tie it or grasp it with a pair of forcipressure forceps.

Under the vague and comprehensive name of shock, one finds several very different elements to be considered. First of all, the exhaustion from hæmorrhage, the importance of which has not been recognised by the operator if it has not come on in the shape of an accident, for, supposing one has not carefully arrested all bleeding step by step, there will be some vessels which have bled throughout the whole duration of the operation. This becomes a very serious matter when it has gone on for a long time, and the patient is already exhausted.

Another cause of so-called shock is acute uræmia due to affections of the kidneys. It is well known how frequently they are affected owing to the compression of the ureters. Many patients with cancer are living, one may say, with a minimum

* Richelot. Union méd., April 3, 1888.

of urine-producing tissue in a sort of unstable equilibrium. Should one happen to upset this precarious state of affairs by any violent perturbation, the uræmia which was coming on, or even threatening, takes place rapidly. The event may then simply occur through the absorption of the chloroform, which produces a fatal congestion of the kidneys as it is being eliminated through them; hence the risk attached to prolonged anæsthesia. It also comes about through the reabsorption of the products of the wound, which obstruct the renal filter and may monopolise the small remaining portion of healthy tissue which was hardly sufficient for the process of depuration during the normal state. There are a great number of cases of death from what is called shock, where the reports of the symptoms and post-mortem appearances clearly show that one had to deal with uræmia, generally in the form of coma. Maybe also the latter has been brought about more often than one thinks, and without one's being aware of it, by unluckily ligaturing the ureters.

To guard against such accidents, one should never perform hysterectomy on patients with albuminuria, or in whom there is a well-marked diminution of the solid constituents of the urine. Should one elect to operate in spite of these unfavourable conditions, one should bear in mind how bad is the prognosis, and try to get over the operation quickly, so that the anæsthesia should last as short a time as possible. I am in the habit of putting my patients on a milk diet for the first few days after the operation, so as to ease the secretion of urine, as well as to allow the food to become better tolerated.

One of the principal causes of septicæmia is the contamination of the seat of operation in its depth by particles of cancerous matter. The best way to guard against this danger is to follow the rules which I have given, and which I repeat: preliminary or extemporaneous curetting of the fungating growth, continuous irrigation during the operation, maintenance of a protective barrier between the cervix, which has been drawn upwards, and the cavity of the peritoneum, avoidance of too much cutting up of the tissues, and of producing their mortification by the use of fixation forceps, and, last of all, the most strict antisepsis.

Survivals from hysterectomy.—Although the operation is still of recent date, there have been many papers published upon it. The most extensive work we possess on the subject is that published

by Hache.* An abstract of it is given in the following table, which I reproduce, although I ought to observe that it unfortunately refers to some comparatively early series, containing cases which were certainly operated upon too late, with no chance of permanent cure. It therefore gives one a much too gloomy idea of the actual results of the operation. But it forms a valuable document, as it allows one to estimate the progress made since 1886.

Out of 150 *patients seen after the operation.*

Period.	Patients lost sight of before recurrence.	Patients dead, or with recurrence.	Patients seen again with no recurrence.
3 months	5	23	122
6 months	6	20	96
9 months	5	10	81
12 months	2	9	70
18 months	10	8	52
2 years	14	0	38
3 years	21	0	17
4 years	10	1	6

By means of the preceding figures one can pretty nearly estimate the proportion of recoveries and recurrences out of 100 cases operated upon in what one might call the initial period of hysterectomy (ending in 1886). To obtain this proportion one is justified, like Hache, in considering any patients lost sight of less than a year after the operation as having relapsed immediately after the last examination they underwent. As for those who have been under observation for more than a year, Hache has reckoned amongst the relapses half those he ultimately lost sight of. The results which follow should therefore be considered as the pessimist interpretation of the preceding statistics.

Out of 100 *patients operated upon*

23 succumbed owing to the operation.
15 relapsed during the first 3 months ...
13 ,, in from 3 to 6 months ... } 28 first quarter.
13 ,, ,, 6 to 12 ,, ... 13 second quarter.
10 ,, ,, 1 year to 2 years ... 10 second year.
26 were well after 2 years.

In trying to make out what percentage of relapses occur

* Hache. *Loc. cit.*, p. 727.

amongst the cases surviving at the beginning of each of these periods, Hache finds that the chances of a relapse are obviously equal during the first two periods of three months, and that they then begin to decrease. This result is evidently due above all to incomplete operations and the immediate recurrence of a growth which has been merely resected. There is also another element, which is the remarkable rapidity with which certain cancers grow, principally in young women. One might mention, as striking examples, a patient operated upon by Tillaux, and two by Tédenat, who relapsed after six weeks, three months, and five months. I have myself observed a case of rapid relapse in a woman of 38 years, suffering from tubulated epithelioma, which presented the appearance of a cancer of the cervix hollowed out into a large cavity. The disease seemed only to have started five months before the operation; the relapse was very rapid, although the whole affection had been removed, and the patient died five months after the hysterectomy.*

An important and more recent document has been given to us by A. Martin in the report which I mentioned. In the series which he collected, and which included the practice of some German gynæcologists until the end of 1886, the following are the results as regards survival; the recurrence occurred after the delay mentioned:—

Recurrence at the end of	Leopold: out of 38 operations.	Schroder: out of 63 operations.	Fritsch: out of 53 operations.	Martin: out of 55 operations.
1 year	16	20	17	35 cases
1½ years	9	10	...	32
2 years.....	5	7	7	25
3 years.....	2	4	2	20
4 years.....	...	...	...	5
5 years.....	...	...	...	3
6 years.....	...	...	...	2

These figures give the following percentage:—

Relapse after 1 year	...	42·51 per cent.	
,, ,, 1½ years	...	33·1	,,
,, ,, 2 ,,	...	21·2	,,
,, ,, 3 ,,	...	13·52	,,
,, ,, 4 ,,	...	2·41	,,

* S. Pozzi. Annal. de gyn., Sept., 1888, vol. 30, p. 192.

The first cures of vaginal hysterectomy done in France gave rise to a discussion at the Société de chirurgie, in October, 1888; their recent date did not allow of an analytical table being made out, but the last statistics communicated to the Société de chirurgie, at the end of 1891,* give us some matter for serious consideration.

P. Segond has operated on 25 cancers of the cervix, with seven deaths from the operation, four deaths from recurrence at the end of a year; three patients were alive with recurrence, two had been operated upon more than a year ago; three are still alive with no recurrence, one since November, 1888, the two others since October, 1889, and April, 1890. The last six operations are of recent date (August, 1891).

Terrier, between June, 1885, and September, 1891, dealt with 29 cases of cancer of the cervix; he had six deaths from the operation. One of his patients has had no recurrence after more than six years and five months, two lived on for four years and a half, two others from three years to three years and a half, three from two years to two years and a half; all the other cases died between one month and one year. Out of three cases of cancer involving both the cervix and the fundus, Terrier had one death from the operation; the two others survived for eight months and thirteen months and a half.

In 1888, Bouilly had performed 29 hysterectomies, with seven deaths. Between 1888 and 1892 he has performed this operation for cancer of the cervix 19 times, with seven deaths; three of his cases remain cured since four years and a half, the other two since nearly four years and more than three years and a half.

Richelot, out of 23 operations, had one death from the operation. Ten patients, the first of which was operated on twenty-two months ago, and the most recent eight months ago, have had no recurrence; five are of recent date (October, 1891). Richelot has also had three patients who have remained cured for from four years and a half to five years.

I have myself had one case of cure lasting two years and a half. One of my patients, operated on two years and a half ago, is still enjoying perfect health.

* See Bull. et Mém. Soc. de Chir. Meeting held Oct. 28, 1891, p. 625 *et seq.*; also Nov. 18, p. 666 *et seq.*; also Nov. 25, p. 688 *et seq.*; and lastly, the meeting held Dec. 2, same year, p. 709.

The most important series of cases which has been published is that of Leopold, dealing with 80 vaginal hysterectomies for cancer; four patients only died from the operation. The whole of this branch of his practice during the last five years and a half is given. Out of 76 women cured, 14 had died at the time of Münchmeyer's * publication, 10 of them from recurrence of cancer; since then † 17 others have died; there remains, therefore, 45 cases, of which 37 have been seen by Leopold, and eight of which have written to him. These 45 cases can be divided in the following manner:—

Patients remaining without any actual recurrence since

2 years after the operation,	45	out of	80	operated upon,	56·25	per cent.
3	„	„	34	„	58	„	58·6	„
4	„	„	25	„	42	„	59·5	„
5	„	„	18	„	30	„	60·0	„
6	„	„	6	„	9	„	66·6	„
7	„	„	2	„	2	„	100·0	„

Hofmeier,‡ Schauta,§ and Olshausen, regarding the end of the second year as the time to judge of the curative value of total extirpation, have arrived at the following figures: Hofmeier, according to Schröder's operations at 20 per 100, and according to his own operations at 60 per 100, Schauta, according to his own statistics, at 47·3 per 100, and, lastly, Olshausen at 47·5 per 100, as representing the proportion of complete cures. It would be better to say durable cures, for the recurrence is still to be feared. It would be illusory, I believe, to speak of definitive cure for cancer of the uterus, any more than for any other malignant growths. One is none the less justified in performing hysterectomy, just as one performs amputation of the breast with curetting of the axilla, with a much more serious prognosis. The recurrence is always to be feared in either case, but a temporary cure is still a cure.

It is interesting to know how long patients survive after partial operations (infra- and supra-vaginal), so as to compare the results

* F. Münchmeyer. Arch. f. Gyn., 1889, vol. 36, No. 3, p. 426.

† Ed. Leisse. Ueber die Endergebnisse der vaginalen Totalexstirpation wegen Carcinom, &c. (Arch. f. Gyn., 1891, vol. 11, No. 2, p. 265).

‡ Hofmeier. Zur Frage der Behandlung und Heilbarkeit des Carcinoma uteri (read at the Soc. phys. méd. de Würtzburg, June 28, 1890, Munich 1890, p. 13).

§ Schauta (of Prague). Centr. f. Gyn., 1890, p. 105 (supplement).—Olshausen, ditto, p. 107.

with those of the total removal of the uterus. I therefore return more in detail to this subject, although it has already been dealt with at some length.

Before bringing forward the various data which we possess about the matter, I point out how cautious one should be in drawing conclusions from two elements which are incongruous. In what cases is amputation of the cervix always done? For cancers which are found in the early stage. In what cases does one generally perform hysterectomy? For cancers which are more or less advanced, and have already involved the body of the uterus. In the first case there is a good chance of the disease not having yet affected the lymphatics; this chance, however, is very small in the second case. Why, therefore, should one be astonished if the recurrence is less rapid in cases where, by amputation of the cervix, one has been fortunate enough to remove the whole disease? Who could, however, venture to say that the cases of cure which are lasting would not have been more numerous if all the cases treated by a partial operation had undergone the total ablation of the organ?* It would be failing to recognise facts, where, with the appearances of a disease confined to the cervix, the mucous membrane of the body of the uterus is invaded by the spreading of the disease, and where the uterine parenchyma has secondary nuclei widely scattered over it.

The comparison which has been attempted between the results of a limited operation and those of a radical one, as regards the survival, could only be fair if it could be applied to two series of patients exactly alike, and affected with diseases limited in an equal manner. But how can one draw a parallel by means of the series which have been published of total hysterectomies, always with a large majority of cases where the disease has possibly gone well beyond the cervix, if they appear by the side of less serious cases which help to make the whole look-out more gloomy? That is why I have thought it right to call in question† the value of the actual statistics on this special point.

* D. de Ott remarks that it is obligatory in regarding the question of survival to divide the patients into two categories: those operated upon at the beginning of the disease, and those in whom the disease is already far advanced. The first category alone has constantly given him more than one year of life after the operation, and amongst them there has been one cure lasting three years and a half, another two years and one month. All the women operated upon late have, on the other hand had a recurrence between one and eleven months.

† S. Pozzi. Bull. et Mém. de la Soc. de chir., 1888, p. 771.

I will all the same, by way of documents, mention the most important statistics, those of Schröder-Hofmeier, of Professor Verneuil, and those of Byrne.

The first in point of time, and not the least curious, is that of Hofmeier,* uniting entire operations (hysterectomies) and partial ones (amputations of the cervix) from the practice of Shröder, between 1878 and 1886. The following are the comparative numbers of the patients who remained cured from the two methods :—

After 1 year	Partial op. ...	49	cured out of	114	operated upon	= 57·0	per cent.†
	Total hysterec.	20	„	„	46	„	= 63·6	„
After 2 years	Partial op. ...	38	„	„	102	„	= 46·0	„
	Total hysterec.	7	„	„	40	„	= 24·1	„
After 3 years	Partial op. ...	24	„	„	76	„	= 42·0	„
	Total hysterec.	6	„	„	31	„	= 26·0	„
After 4 years	Partial op. ...	19	„	„	59	„	= 41·3	„
	Total hysterec.	0	„	„	18	„	= 0·0	„

One sees the enormous advantage, beginning at the second year, belonging to both supra- and infra-vaginal amputation of the cervix; at the end of 3 years, 24 patients out of 76 ; at the end of 4 years, 19 patients out of 39 who had removal of the cervix performed, had no return of the cancer. One may perhaps ask if it is simply because they alone had been operated upon before the lymphatics became affected.

The results of Professor Verneuil‡ are no less remarkable. The following are the proportions of cases of recurrence and the time after which they happened amongst the patients who had infra-vaginal amputation of the cervix performed with the écraseur ; out of 21 cases of removal by operation there were 9 cases of early recurrence. It is as well to mention that six times at least out of nine cases Professor Verneuil recognised at once from the examination of the parts that the removal had not been complete. In the 12 others the seat of operation remained free from any fresh growth ; in two cases until death,

* M. Hofmeier. Ueber die endgültige Heilung des Circinoma cervicis uteri durch die Operation (Zeitsch. f. Geb. u. Gyn., 1886, vol. 13, No. 2, p. 360).—One should not mistake this work, which is the most complete, for other publications of Hofmeier's on the same subject (Centr. f. Gyn., 1884, p. 284; ditto, 1886, p. 92, and Berl. Klin. Woch., 1886, Nos. 6 and 7, pp. 91 and 106). Some remarkable differences exist between the figures given in these various works, and they have brought about a certain confusion when quotations have been made from them.

† It is by an error of calculation (*loc. cit.*, p. 366) that the author gives 51 per 100 in his report.

‡ Verneuil. Bull. et Mém. de la Soc. de chir., Oct. 1888, p. 717.

which occurred after 7 years and after 17 months; in 5 cases until the time when the patients were lost sight of, being in very good health, 3 years on an average after the operation; in two cases in patients still alive to-day, but suffering from recurrence in a distant part, come on after three years of apparent cure; last of all, in three cases of women who are actually in good health, having been operated on five years, 17 months, and three months ago.*

J. Byrne,† in a more recent publication, has given the results of his own experience for more than 20 years. He has dealt with 81 cases of cancer of the cervix, and has always performed partial ablation with the galvano-cautery. As regards recurrence, he has remarked that the growth had not reappeared for more than 17 years in one patient, for 13 years in another, 11 years in 2, 7 years in 6, 5 years in 8, 4 years in 6, and lastly, for more than 3 years in 11 of the cases operated upon.

As opposed to these series of cases, which prove so much in favour of the therapeutic value of partial operations, one must for truth's sake mention the results obtained in the practice of A. Martin.‡ Brought up in Schröder's school, he had begun by doing supra-vaginal amputation in cases of cancer of the os tincæ whenever theoretically it seemed to be called for. The results were most unfortunate. Out of 28 patients 2 only lived for one year with no recurrence. After that he adopted early hysterectomy, and the duration of the cures was considerably increased.

In the face of these contradictory facts, and in the absence of precise means of comparison, I must go on challenging the value for such comparison of documents which are quite dissimilar, and must plead for a little reasoning.

I do not see how one can logically say anything in favour of a conclusion, so much of the nature of a paradox, that more good

* Winter (Ueber die Schröder'sche hohe Amputation, in Centr. f. Gyn., 1891, No. 29, p. 611) has recently published the immediate results of partial amputation; according to Schröder, in 155 cases there were 10 deaths due to the operation, *i.e.*, 6·5 per 100; after 2 years, 38 per 100 of the women were still well; 26·5 per 100 had no relapse after 5 years.

† J. Byrne. A digest of 20 years' experience in the treatment of uterine cancer (Amer. Journ. of Obstet., 1889, vol. 22, p. 1052), Philadelphia, 1890, p. 16.

‡ Martin. *Loc. cit.*, 2nd edit., p. 309.

can be got from the restricted removal of the tissue round the disease than from the freest removal which is possible.

Quite recently, surgery has been making efforts to open out new means of entrance into the pelvic cavity. Otto Zuckerkandl* has proposed going through the perineum by dividing the recto-vaginal wall with a transverse incision, so as to make use of the whole of the space comprised between the ischiatic tuberosities, instead of the limited space between the walls of the vagina. Frommel† has adopted this method with success, and maintains

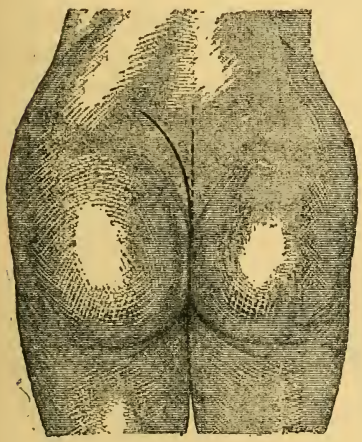


Fig. 197.—Hysterectomy through the sacrum. Line of the incision (the dotted line merely shows the axis of the body).

Fig. 198.—Hysterectomy through the sacrum. The various sections through the sacrum.

that it allows the ordinary limits of hysterectomy to be considerably extended. Sänger,‡ on the contrary, after trying the operation on the dead body is entirely opposed to it.

E. Zuckerkandl§ and Wölfler's‖ para-sacral and para-rectal incisions might, according to these authors, allow sufficient room

* Otto Zuckerkandl. Wien. med. Woch., 1888, Nos. 11 and 16; 1889, Nos. 12, 14, 15, 16, and 18; and Wien. med. Presse, 1889, No. 7, p. 249.

† Frommel (of Erlangen), 3rd Congress of Germ. Gyn., Friburg, 1889 (Centr f. gyn., 1889, No. 31, p. 542).

‡ Sänger, ditto, p. 543.

§ E. Zuckerkandl (not to be mistaken for Otto Zuckerkandl). Notiz über die Blosslegung der Beckenorgane (Wien. klin. Woch., 1889, pp. 276 and 356).

‖ A. Wölfler. Ueber den para-sacralen und para-rectalen Schnitt zur Blosslegung des Rectums, des Uterus und der Vagina (Wien. klin. Woch., 1889, No. 15, p. 296).

for hysterectomy in difficult cases. This consists in a deep incision either on the left (E. Zuckerkandl) or on the right (Wölfler). Wölfler makes it start a little above the sacro-coccygeal articulation 1 or 2 centimetres to the side of this point and carries it downwards with a curve, the concavity of which is outwards, corresponding to the tuberosity of the ischium, to within 2 or 3 centimetres of the fourchette. An opening is thus made into the lower part of the ischio-rectal fossa; the gluteus maximus is dissected, and part of it is removed (Wölfler then removes the coccyx which is left by E. Zuckerkandl), the sacro-sciatic ligaments are also divided, as is the levator ani, and the rectum is separated from the vagina. The culs-de-sac of the vagina must then be incised, and the

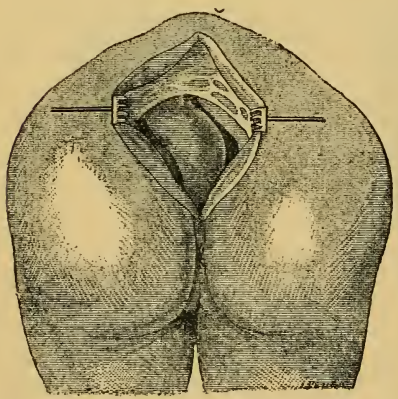


Fig. 199.—Hysterectomy through the sacrum. The breach obtained by the preliminary operation.

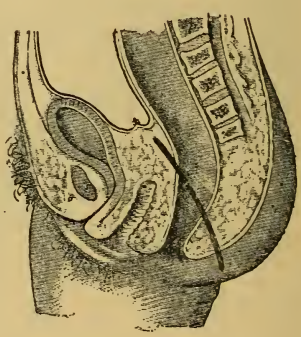


Fig. 200.—Hysterectomy through the sacrum. Method of union and drainage of the wound.

hysterectomy is proceeded with on the lines I have given above. The operation is finished by closing the peritoneum and vagina very exactly and draining the para-sacral wound, which should be somewhat narrowed by means of some sutures. Wölfler has made use of this method for the removal of the rectum as well as for that of the uterus on living subjects, whereas E. Zuckerkandl has merely experimented on dead bodies.

What seems to me a much more rational and much bolder method is the application to gynæcology of the preliminary

operation first imagined by Krase for penetrating deeply into the pelvis in search of a cancerous rectum. This, as is well known, consists in removing not only the coccyx, as Verneuil and Kocher did, but also the lower part of the sacrum, so as to make a very large opening in which one has room to act with freedom.

The patient is laid on her right side; an incision is made, beginning at the point of the coccyx, running along the side of this bone for about ten centimetres, then turning towards the middle of the sacro-iliac synchondrosis where it terminates (fig. 197). The coccyx is bared by means of a rasp, and removed; the lower part of the sacrum is freed in the same way, and is then cut away with a strong pair of cutting forceps, first of all laterally, and then, if need be, transversely; it is enough to resect the bone above the third sacral foramen to have sufficient room without wounding any important nerve (fig. 198). The rectum (which one is recommended to stuff with iodoform gauze to facilitate the operation) is then pushed on one side; an incision is made into the peritoneum, and Douglas' pouch is opened. An enormous breach is thus obtained (fig. 199), through which one can get a good view of the anterior wall of the abdomen between the symphysis and the umbilicus, above the bladder.*

The first surgeon to make any dissections on the dead body with the view of applying Kraske's method to hysterectomy was C. A. Herzfeld† (of Vienna); but it was Hochenegg‡ who first published an account of any operations on the living subject. One was performed by Gersuny, who was thus enabled to extirpate an enlarged uterus with a cancerous mass growing into the sub-peritoneal cellular tissue; the other was an operation done by Hochenegg himself; he removed along with the uterus an

* Kraske. Verhandl. des 14th Kongr. der deutsch. Gesell. f. Chir., 1885.—J. Hochenegg. Die sacrale Methode, &c. (Arbeit. und Jahresb. der ersten chirurg. Universitäts-Klinik zu Wien. Vienna, 1889, p. 13).—Roux. On reaching the pelvic organs through the sacrum. (Corr. Blatt. f. schweiz. Aerzte, 1889, vol. 19, p. 449.)

† C. A. Herzfeld. Ueber die Anwendung des Kraske'schen Verfahrens in der Gynækologie (Allg. Wien. med. Zeit., 1888, p. 411).

‡ J. Hochenegg (of Vienna). Die sacrale Operat. in der Gyn. (Wien. klin. Woch., 1889, No. 9, p. 171). This author had already incidentally given out the idea that Kraske's preliminary operation might be applied to extirpation of the uterus and appendages, in a paper on extirpation of the rectum which appeared a little before Herzfeld's work (J. Hochenegg, Wien. med. Woch., Aug., 1888, No. 19).

ovarian cyst, which was adhering to it, of the size of the fist. Both cases were followed by cure, accompanied in the second case by an intestinal fistula.

A modification of the preceding method was almost immediately started by Hegar.* This was to give up the entire removal of the coccyx, and the lower part of the sacrum, and to merely pull them aside. When the hysterectomy is over, the flap containing the bones is put back in its place; thus one performs a preliminary osteo-plastic operation. Hegar has on one occasion seen the bone necrose after its displacement, and on another found that it remained movable. Roux (of Lausanne),† and quite recently Terrier‡ have followed Hegar's example in extirpating bulky cancerous masses which could not have been removed through the vagina.

Hochenegg recommends one, when engaged in the operation, only to set about freeing the vaginal culs-de-sac, after the wound through the peritoneum has been closed with sutures; by this means one is best guarded against any infection from the cancer. With the same object, and also to insure the parts being more thoroughly closed, von Beck dissects a strip of peritoneum off the anterior surface of the uterus and brings it into use.

Zinsmeister has pointed out that there is a certain difficulty in finding deep down in the wound the peritoneal cul-de-sac; this seems to be due to some fault in the operation, to an incision

* Hegar, mentioned by Weidow. Berlin klin. Woch., 1889, No. 10, p. 202.—Weidow, 3rd Congress of Germ. Gyn., Friburg, 1889 (Centr. f. Gyn., 1889, No. 29, p. 502).—Bernhardt v. Beck. Die osteoplastische Resection des Kreuzbeines, &c. (Zeitschr. f. Geb. und Gyn., 1890, vol. 18, No. 1, p. 37) and Soc. obst. et gyn. de Vienne, Nov. 5, 1889 (Centr. f. Gyn., 1890, No. 3, p. 50). Out of 4 cases mentioned by von Beck, there were 2 deaths and 2 cures, followed by the rapid fixation of the sacrum. Zinsmeister (ditto) reports one case where the rectum was wounded, and where death followed in four hours.

Hegar performed his first hysterectomy through the pelvis in Nov., 1888, whereas Gersuny did his in December, but the latter's case was the first to be published.

† In the second case which he mentions there was a very narrow vagina to be dealt with, and there was some fear that there might also be adhesions in the neighbourhood of the bladder. Roux lifted up the flap composed of the bone and the skin as one would open a door, after making a transverse section through the sacrum with a cutting forceps, and fixing it back temporarily to the buttock with a suture, so as to keep out of the way. After the removal of the uterus, the vagina is sewn up, the flap put back in its place, and the wound is plugged with iodoform gauze and closed at its extremities. Both patients got well.

‡ Terrier and Hartmann. On the removal of the uterus by the sacral method (Annal. de Gyn. et d'Obstet., 1891, vol. 36, pp. 84 and 91).—These authors have collected 23 cases of hysterectomy by the sacral method with 7 deaths.

not carried low enough; the latter should almost reach the anus.

Taking into consideration the relations of the rectum, it is better to approach it from the left side and to throw it on one side. The organ is rendered much more apparent, and in consequence runs less risk of being wounded, if it has first been moderately plugged. Any wound made in it would constitute a great danger, and would require the introduction of some sutures in layers. The ureter also may be divided. Should this happen the upper end should be brought into the rectum or vagina, which later on can be made to have a large communication with the bladder, whilst the lower portion becomes obliterated. This would be preferable to the formation of an urinary fistula on the level of the wound.

After the deeper part of the wound has been very carefully sewn up, first near the peritoneum (before the removal of the uterus), then near the vagina when the removal is accomplished, one should close the external wound, leaving, however, a fairly large window for the drainage and the antiseptic plugging of the cavity or dead space which always remains. The plug can first of all be left in place for six or eight days, then renewed, and gradually diminished as the cavity becomes filled up. It would be most dangerous to completely close the parts without allowing some safe issue for any fluids which may be secreted.

There is no doubt that the preliminary operation of resection of the coccyx or the sacrum greatly facilitates the removal of cancers, which otherwise could only have been dealt with through the abdomen.

The manipulations required for removing the tumour and arresting the hæmorrhage are thus rendered incomparably simpler. One has a valuable resource for cases where the uterus is too bulky, or the vagina too narrow to allow access through the natural tracts. But this newly found method of simplifying one's operations will not alter the limits which I have laid down as those within which one must keep in performing hysterectomy. Whenever the cancer has spread beyond the limits of the uterus, one should refrain from attempting total extirpation.

IV.—*Cancer growing from the cervix where there is certainty or suspicion of its having spread deeply.*—Whenever one has found, after trying to see how far the uterus is movable, that it is

difficult to bring the organ down, and that by means of bimanual palpation one has become aware of there being tumefaction of the parts and puffiness on either side of the uterus, two hypotheses are possible: there is either perimetritis with adhesions, or there is spreading of the growth into the cellular tissue and broad ligaments. In the first case, the operation would be difficult and perhaps dangerous (on account of the possible existence of purulent centres as in Le Bec's* unfortunate case); in the second, it would be dangerous and useless. It is therefore better to abstain from the operation, in spite of the advantages to be gained by the sacral method.

Besides, the prognosis becomes twice as serious when the operation deals with cancers which have spread. Martin† has reported a death-rate of 30 in 100 in such cases, instead of 16·92 in 100, which is what he obtained in operating on cases of limited cancer. There is no doubt that most of our statistics are burdened with a large number of such cases. The mistake has been to fix the name of palliative hysterectomy‡ on the removal of the uterus surrounded by a deep cancerous growth, just in the same way that by giving the name of irregular sub-vaginal amputations§ a recognised place in surgery has been found for those hysterectomies undertaken without sufficient examination, and which have to be abandoned after an exploratory dissection. This is an unfortunate abuse of scientific language which seems to sanction an operation in cases where it is distinctly contra-indicated. Such an operation, when it does not kill the patient (which it frequently does), is much less efficacious as a palliative than cauterising the parts after curetting them.

V. *Cancer of the cervix with primary or secondary invasion of the vagina.*—To my mind this invasion formally contraindicates any radical operation; for it is either a proof of the cancer having spread very widely and already affected the lymphatics, or it results from the so-called vaginal form of cancer of the cervix (for which I

* Le Bec. Vaginal hysterectomy, double pyo-salpinx, septic peritonitis. (Gaz. des Hôp., 1888, p. 32.)

† A. Martin. Zur Statistik der vaginalen Totalexstirpation bei Carcinom (Berl. klin. Woch., 1887, No. 5, p. 69).

‡ Richelot, in de Madec. Surgical treatment of cancer of the uterus. Thesis for M.D., Paris, 1887, p. 90.

§ G. Richelot. Union méd., 1888, p. 111.—See my criticism on the subject (Ann. de gyn., Aug., 1888, vol. 30, p. 92).

have proposed the name of preliminary), which has an irresistible tendency to spread to the vagina, and recur *in situ* with a fatal result. It would therefore be within reason to remove the whole vagina, rather than the whole uterus. Here again curetting and cauterising act as the best palliatives. One should act in the same way when dealing with cancers of the breast (purulent cancers, Velpeau's cancers *en cuirasse*), abstaining from an operation even if it is anatomically practicable; surgery does not consist in operative medicine.

VI. *Cancer of the cervix spreading not only to the vagina, but also to the bladder and rectum.*—In spite of some well-known surgeons* advising the contrary, to attempt an operation with the idea of curing the disease, and for this to remove the uterus and the parts of the rectum and bladder which are invaded, seems to me a fatal illusion. It is true the operation can be performed, and may be followed by immediate success; but the recurrence, or rather the continued growth on the same spot, is very soon fatal, for a cancer so far advanced must have already attacked the lymphatics. Lastly, as the gravity of hysterectomy is considerably increased in such cases, it is questionable whether it is wise to expose patients to such great risk for so doubtful an advantage.

In the last three classes of cases that I have been talking of, the object to be had in view is a palliative operation, capable of bringing about the suppression of the two great causes of the patient's prostration, hæmorrhage and fœtid discharge. For this, one should rapidly destroy any fungating growths which are going through a slow process of disintegration, and thus producing the above symptoms. The instrument to be selected for this is the curette, or better still Simon's sharp-edged spoon, which is well adapted for dealing with cancerous masses (fig. 201). The most bulky portion of the fungus is scooped away rapidly with one of the larger instruments, and then any

* Mikulicz, mentioned by Schwartz (Rev. de chir., 1882, p. 497), referring to this subject, says: "So long as *noli me tangere* is the rule for the bladder and rectum, so long will the extirpation of the uterus fail to be accompanied by the desired results; one should have no fear in attacking the rectum and bladder boldly, since they are not organs essential for maintaining life."—Terrier (mentioned by Gomet, Thesis mentioned, 1886) has evidently been inspired by those words, when he says "that he would not hesitate so long as the extirpation of the invaded parts of the rectum and bladder would not be incompatible with existence."

vegetations situated more deeply are got at with one of the smaller ones. One should go to work with the greatest caution in any dangerous regions, especially when near the bladder or ureters. Should one penetrate the cavity of a uterus the subject

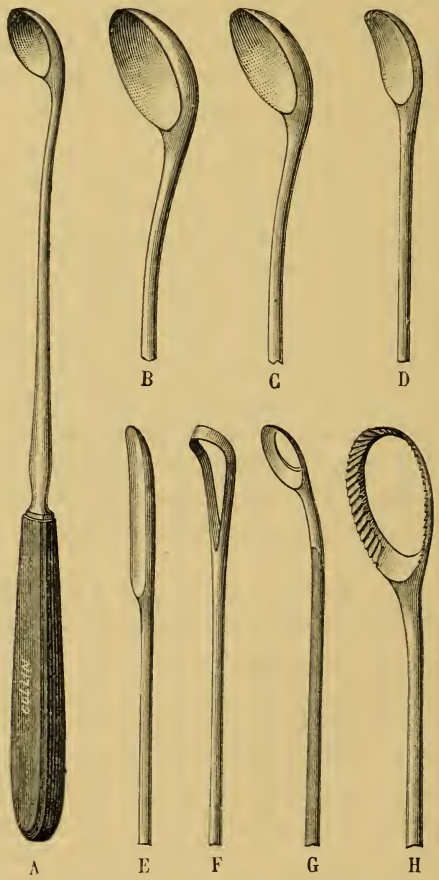


Fig. 201.—Curettes with cutting edges.

A, B, C, D, Simon's curette.—E, Récamier's curette.—F, Sims' curette.—G, fenestrated curette with malleable stem.—H, Thomas' curette with serrated edge.

of a growth, one should be careful only to attack its surface obliquely, and not perpendicularly, so as to avoid perforating it.

The surfaces having been thoroughly cleared, Martin* has no hesitation in bringing the parts which have been freshened up

* Martin, *loc. cit.*, p. 99, and v. Rabenau. Berl. klin. Woch., 1883, No. 13, p. 188.

into apposition, trusting to their becoming united by first intention; but it seems to me that the cases suitable for this ingenious method are very rare, and that it has more than one inconvenience. I much prefer following up the curetting with a free application of the actual cautery, which spreads far and wide, causing the death of the morbid growths in the midst of the healthy ones, which have more power of resistance. The actual cautery should be applied by means of a reed-shaped or bulbous iron. The thermo-cautery is not sufficient. This method is obviously the one which was followed by such good results in the hands of Koeberlé and Baker; Schröder also recommends it. I have also derived the greatest advantage from it.*

This treatment can be renewed several times at a few weeks' or months' interval. If one operates rapidly, by swabbing the vagina with cocaine, and under an almost continuous cold irrigation, one can do without an anæsthetic, which is an advantage, since the patients are generally in a very low condition, with their kidneys more or less affected. The operation causes little pain, and it is only the preparations for it, which should always be concealed, that are at all dreadful.

After the use of the curette a tampon of iodoform gauze should be placed in the hollow or cavity which has been left, and should be renewed after two days.

One should then have recourse to injections of a 1 in 5000 perchloride solution, which appears to me the most suitable. As soon as the granulations in the deeper part of the vagina begin again to secrete at all copiously, I apply a small disc-shaped tampon saturated with a ten per cent. solution of chloride of zinc, and keep it firmly fixed and isolated by means of a larger tampon made of iodoform gauze soaked in a solution of bicarbonate of soda. The complete "tamponnement" of the vagina is then continued with cotton-wool so as to avoid any displacement. This dressing can be renewed every other day, and should always be preceded by a free douching with the perchloride.

* Koeberlé. Gaz. hebd., Feb. 26, 1886, No. 9, p. 140.—W. H. Baker. Amer. Journ. of Obstet., 1882, p. 265, and 1886, p. 184.—Schröder, *loc. cit.*, p. 325.—Despréaux. Du curettage utérin. Thesis for M.D., Paris, 1887.—Adrien Pozzi. The treatment of cancer of the uterus. Thesis for M.D., Paris, 1888.

The potential cautery.—A great use has been made in other countries * of alcoholic solutions of bromine (1 in 5). The vagina requires to be well protected by a tampon soaked in a solution of bicarbonate of soda. Canquoin's paste and Filhos' caustic have had ardent supporters, but the numerous accidents (perforations, peritonitis, &c.), following more especially upon the use of the arrows, have almost caused their use to be given up; one should, however, remember that chloride of zinc, managed with prudence, can be of undoubted service. Maisonneuve and Demarquay were the first to apply this caustic to the treatment of cancer of the cervix. Marion Sims,† to whom many foreign authors attribute the merit of this proceeding, only came after them. Van de Warker‡ imitated the latter in his special method without mentioning him. Fränkel§ has been again quite recently recommending the same agent. This is how he sets about it: he cleans the cervix with the curette and stops the bleeding with the thermo-cautery, without dwelling too much upon this first application of the cautery; he then applies over the os some small pledgets of cotton-wool, soaked in a 2 to 3 solution of chloride of zinc. He leaves them in place for from twelve to twenty-four hours. To neutralise the effect of the caustic upon the vagina, Fränkel, following Sims' example, puts an upper layer of pledgets soaked in a concentrated solution of bicarbonate of soda, and smears the vulva with vaseline containing carbonate of soda (1 in 3); the slough shrivels up and comes away about the tenth day.

As a disinfecting injection, in cases of very fœtid cancer, one will get good results from solutions of permanganate of potash, of a strength of 10 or 20 per 1000 (the solution should be of a dark, cherry-red colour), or from more or less diluted solutions of Labarraque's fluid. But I cannot too strongly advise one not merely to be content with that, according to the habit of most practitioners, but to follow up the use of the disinfecting

* C. H. F. Routh. Brit. Med. Journ., Feb. and March, 1870, vol. 1, pp. 178 and 230.—Schröder, *loc. cit.*, p. 325.

† Marion Sims. Amer. Journ. of Obstet., 1879, vol. 12, p. 451.

‡ E. van de Warker. Ditto, 1884, vol. 17, p. 225.

§ Fraenkel. Centr. f. Gyn., Sept., 1888, No. 37, p. 593.—See a discussion on this subject at the Soc. of Gyn. of Berlin, June 22, 1888 (ditto), where Martin condemns caustics, because in using them one cannot see exactly what one is doing, and they are therefore dangerous.

injection by the destruction, by means of a curette, of all the putrid fungating growth, which is not, correctly speaking, an operation; anyone with too great a dread of the red-hot iron, may still get a good enough result by applying small pledgets soaked in chloride of zinc, after the scraping.

To stop the hæmorrhage, which will be considerably lessened by the above-mentioned precautions, one may have recourse to tampons made of gauze or cotton soaked in perchloride of iron, and then dried and sprinkled with iodoform. The red-hot iron boldly applied is the most effectual method, the *ultimo ratio*. Ergot has hardly any effect at all; but some benefit will be derived from digitalis.

Erythema of the vulva will disappear if one insures scrupulous cleanliness, with frequent baths and the application of lotions and boracic vaseline as a protection against the vaginal oozing.

Gastric troubles have to be treated with tonics and bitters (quinine wine, Colombo wine, infusion of quinine, Baumé's bitter tincture in doses of 2 or 3 drops before each meal, or tincture of nux vomica in 10 or 15 drop doses); amorphous quassine may be given once or twice a day in pills of 1 centigramme; lastly, one should give a milk diet when there is any renal complication.

For incessant vomiting of an uremic origin, Winker has derived benefit from the administration of one drop of tincture of iodine in water at each meal.

Constipation should be carefully treated, as it is a cause of metrorrhagia, owing to the efforts it necessitates. It is best to make the patients take a light diet, with plenty of vegetables, fruit, prunes, &c. A large enema of warm water given daily will enable one to dispense with the purgatives which by their repeated use become so injurious. One may, however, if necessary, give some small doses of rhubarb combined with belladonna to avoid any griping (90 centigrammes of powdered rhubarb with 1 centigramme of powdered belladonna in a cachet). Lastly, if these means fail, one must resort to some drastic purgative, one of the best of which is podophyllin (one pill containing: podophyllin 3 centigrammes, extract of belladonna 1 centigramme).

Pain is rarely relieved by surgical intervention, but the frequent injections and dressings diminish it considerably. It

would be nothing but cruelty to deny injections of morphia to patients who are beyond hope; one should merely try to limit their employment and avoid the abuse which would end by upsetting the digestive organs and lowering the vital forces.

Certain specifics have been praised: hemlock, which does nothing but aggravate the gastric troubles; condurango (as a decoction, 16 grammes to 200 grammes of water), which merely acts as a stomachic; Chian turpentine (0·5 gramme to 1 gramme in pills), which appears to do no harm even if its power has not been proved.

Cancer of the cervix complicated with pregnancy.—It is impossible, when there is cancer of the uterus present, to recognise that a woman is pregnant before the fourth month, because the size of the fundus can quite legitimately be put down to an extension of the growth. Should one however be able to diagnose it at this early period, should one have to modify one's treatment? I do not think so. Knowing, as we do, the fatal influence of pregnancy, the progress of cancer on one side makes an abortion possible, and on the other makes a vaginal hysterectomy legitimate whenever it is applicable to a gravid uterus. For this it is necessary: 1, that the cancer be limited and not spreading; 2, that the size of the uterus allow of its being extracted through the vagina. The operation is then remarkably easy on account of the laxity of the tissues.* It is infinitely preferable to infra- or supra-vaginal amputation of the cervix, which when it has been performed has most often brought about an abortion and been rapidly followed by a recurrence.†

Supposing the cancer to have begun spreading, a distinction should be made between the different cases; should the cervix be rigid and clearly undilatable, one should bring on abortion, then proceed to the palliative treatment of the cancer (curetting and cauterisation). Should the cervix be spongy but extensible, with the whole circumference not yet invaded, it is better to wait and only to bring on a premature delivery if the sounds

* Hofmeier. A gravid uterus at the second month, with cancer of the cervix removed by hysterectomy, presented to the Gyn. Soc. of Berlin. (Centr. f. Gyn., 1887, No. 13, p. 212.)

‡ Hofmeier. Ueber Operationen am schwangeren Uterus (Deutsche med. Woch., 1887, No. 19, p. 397).

of the fœtal heart become weaker and death looks like imminent.

When the labour is tedious recourse should be had, according to circumstances, to the forceps or to version, and as a last resource to Cæsarian section. One should not, in my opinion, sacrifice a living child to a mother who is past hope, by doing craniotomy.*

Last of all, one has to deal with cases, rare it is true, where the cancer is still limited, but where the uterus is too much developed for one to think of vaginal hysterectomy without previously emptying it. It is impossible to give any fixed rules suitable for all cases; the study of each separate case should help to guide the surgeon. The following are the operations one may then have recourse to, according to circumstances:

(*a*) Induced labour followed by hysterectomy after a few days.†

(*b*) Cæsarian section followed later on by colpo-hysterectomy.‡

(*c*) Total extirpation of the gravid uterus by laparotomy combined with dissection of the vagina, according to the method first practised by Spencer Wells, October 21, 1881.§

(*d*) Hysterectomy through the pelvis (after resection of the coccyx, and, if necessary, part of the sacrum).

Cancer of the cervix complicated with fibrous tumours.—If the fibrous tumour is of great size and is likely to prove a decided obstacle in the way of a vaginal hysterectomy, there is nothing left but the choice between Freund's operation (through the abdomen), the removal through the pelvis, or the use of the

* See on this special point, Barbulée. On the course to be adopted in cancer of the cervix uteri during pregnancy, labour, and the puerperium. Thesis for M.D., Paris, 1884.—Bar. On cancer of the uterus during pregnancy and labour. Thesis for M.B., Paris, 1886.—A. Gusserow. Die Neubildungen des Uterus, 1886, p. 251.—E. Herman. On the treatment of pregnancy complicated with cancerous disease of the genital canal (London Obstet. Trans., 1878, vol. 20, p. 191).—H. T. Hanks. Pregnancy complicated by uterine tumours (Amer. Journ. of Obstet., March, 1888, pp. 242 and 304).

† Berthold (Gaz. des hôp., 1886, No. 46) has reported an observation by Bouilly, followed by cure of the mother. It was a six months' pregnancy.

‡ Teuffel. Ein Fall von Kaiserschnitt bei Carcinoma uteri (Arch. f. Gyn., 1889, vol. 36, No. 2, p. 352): Extraction of a living child by the Cæsarian section. The mother survived 21 days, and succumbed to septic infection. Teuffel advises one to avoid this mishap by introducing a large drainage tube into the cervix after the operation, whenever it happens to be obstructed by the growth.—Wilh. Merkel (Münch. med. Woch., May 21, 1889, p. 365) was thus able to deliver a living child, but the mother died the seventh day.

§ Sp. Wells. Ovarian and uterine tumours, London, 1882, p. 518.

curette followed by cauterisation. I should myself follow one or other of the last two methods on account of the great dangers in the way of abdominal hysterectomy.

Should, however, the fibrous tumour be of small dimensions, vaginal hysterectomy should be performed. I succeeded without much difficulty in a case where there was a sub-peritoneal fibroma larger than the fist.*

Cancer of the cervix complicated with ovarian cyst.—Ought one, if the cancer of the cervix warrants a hysterectomy, to perform that operation before or after ovariotomy, or should both be performed on the same occasion? It seems to me that one should first of all deal with the affection which is the most threatening in its progress, the cancer; should a radical operation be justifiable, the whole mass should be extirpated through the vagina, and, after the cure, one will proceed to the ovariotomy; if, on the contrary, nothing but palliative treatment of the cancer can be resorted to, owing to the extent to which it has spread, one need not think of an ovariotomy, since the patient has but a short time to live. R. Asch† did not fear to do the two operations at the same sitting.

I have myself seen a curious case of suppuration and cure by the spontaneous evacuation of an ovarian cyst after a colpo-hysterectomy. I had decided to do the ovariotomy after my first operation, when, without any noticeable febrile disturbance, on the fifteenth day a sort of purulent discharge took place through the vagina, the cystic tumour became collapsed, and soon a complete cure followed.‡

* Bourges. Gaz. méd. de Paris, July 7, 1888, p. 319.

† Robert Asch. Vaginale Totalexstirpation des Uterus und Ovariotomie in einer Sitzung (Centr. f. Gyn., 1887, No. 27, p. 425). He began by removing the uterus through the vagina, then the ovarian cyst by laparotomy. The operator noticed, when beginning his second operation, the presence of air bubbles in the peritoneum, no doubt introduced by the opening made in the vagina. On the eighth day the sutures gave way, the wound gaped, the intestines protruded through the bandages and lay for two hours on the thighs. The coils of intestine were cleaned with carbolic compresses and put back into the abdomen, which was sutured for a second time; a cure followed. It is clear that this serious accident would have been avoided if the two operations had been done at different times.

‡ S. Pozzi. Ann. de Gyn., 1888, vol. 30, p. 81.

CHAPTER III.

CANCER OF THE BODY OF THE UTERUS.

Definition. Benign and malignant adenoma.—Varieties of cancer of the body.—Epithelioma of the mucous membrane: Morbid Anatomy. Signs. Diagnosis. Prognosis. Etiology.—Diffuse sarcoma of the mucous membrane: Morbid anatomy. Signs and diagnosis. Prognosis. Etiology.—Fibro-sarcomata: Morbid anatomy. Signs. Diagnosis. Etiology.—Treatment of cancers of the body. Vaginal hysterectomy. Hysterectomy through the sacrum. Supra-vaginal hysterectomy. Complete abdominal hysterectomy (Freund's operation). Gravity. Palliative treatment.

Adenoma of the uterus.—There exists a certain confusion in the works published abroad on the subject of adenoma of the uterus. Certain authors give the name of typical or benign adenoma to the kind which I have described in a preceding chapter (vol. i. p. 175) as glandular endometritis, and that of non-typical or malignant to the first stages of epitheliomatous degeneration of the mucous membrane. Whereas some surgeons treat the matter exclusively from an anatomical point of view, and lay most stress upon the histological distinctions and denominations, I have, with most of the French authors, given the most importance to the clinical differences in making a classification, hence the divergence of opinion. As to the question of adenoma of the uterus, it cannot be decided by the patient's bed-side. I shall therefore simply refer anyone for all that concerns benign adenoma* to the chapter on metritis.

The subject of glandular metritis will have to be consulted for the description of its morbid anatomy. I refer anyone to catarrhal and hæmorrhagic metritis, and to mucous polypi for the symptoms.

As for malignant adenoma, it is, practically, the preliminary stage in the growth of cancer of the mucous membrane. If one desires to make a more special distinction, one should call it,

* H. Coe (Adenoma uteri, in Amer. Journ. of med. Sciences, Aug., 1891) has published an article on adenoma of the uterus, viewed as a well-defined morbid entity.

keeping in view its histology,* glandular epithelioma, adeno-carcinoma, or glandular carcinoma.

One need but to look at the two following figures to see the enormous difference which distinguishes them, and at the same time to perceive the transitional stages in the transformation of one of these affections into the other, so that a lesion which first of all was a slight glandular endometritis, becomes, when aggravated, a glandular endometritis of the most characteristic type (typical benign adenoma), then when it has degenerated, a non-typical malignant adenoma, which is the first step towards cancer.†

In the so-called benign adenoma (fig. 202) the glandular proliferation is absolutely typical; there are nowhere any solid

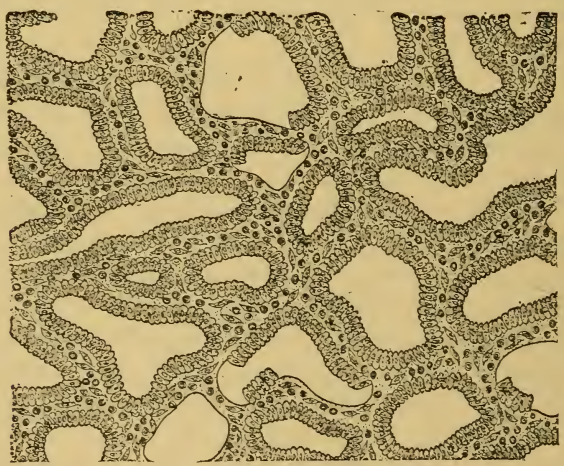


Fig. 202.—Benign adenoma of the uterine mucous membrane (Wyder). (Compare this figure with fig. 97, glandular endometritis.)

epithelial tubes to be come across. The cylindrical epithelium is found in a single layer. Between the glandular tubes there still remains a certain amount of normal inter-glandular tissue. The glandular layer and the muscular layer are well defined;

* Carl Ruge. Ueber Adenoma Uteri (Verhandl. der deutsch. Gesellsch. f. Gynäk. zu Halle, May, 1888, p. 195).

† As an example of the abuse of terms brought about by the employment of the word adenoma, see the numerous observations by German surgeons, and especially by Fredrich Schatz. Ein Fall von Fibro-adenoma cysticum et polyposum corporis et colli uteri (Arch. f. Gyn., 1884, vol. 22, p. 456).

the glands have no tendency to penetrate the muscular parenchyma and destroy it.

In malignant adenoma (fig. 203), contrary to what one sees in the preceding case, the proliferation of the glands is non-typical. Possessing a single coating of cylindrical epithelial cells, they present a series of coils and glomeruli, which justify Schröder's comparing them to earth-worms. The fibrous substratum has

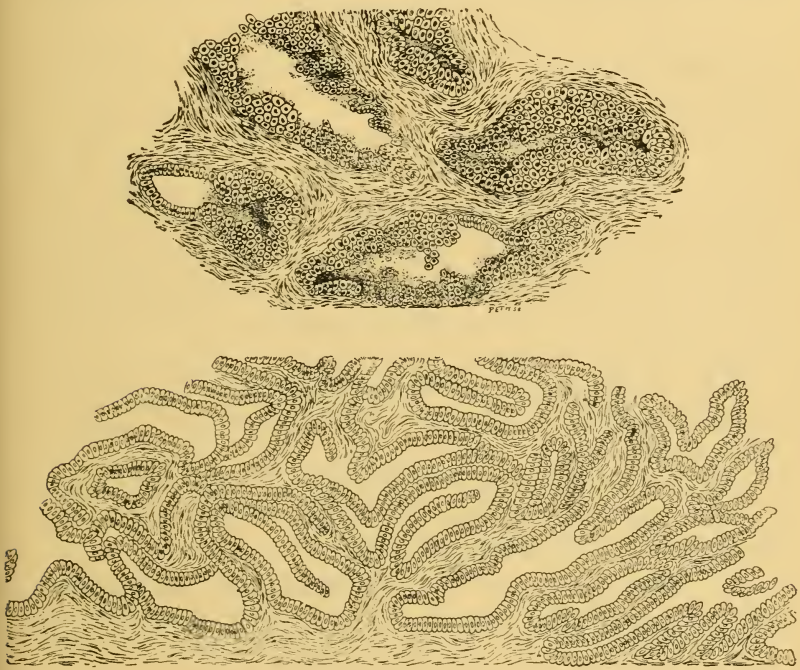


Fig. 203.—Malignant adenoma of the uterine mucous membrane (Ruge and Veit). (Glandular epithelioma in the first instance).

almost entirely disappeared, and the glands are directly in contact at certain points. There is no longer any separation between the glands and the muscular tissue of the uterus.

The above figure, borrowed from Ruge and Veit,* represents the initial lesions of a cancer derived from a malignant adenoma, forming the last stage in the morbid progress which I have just mentioned. The lumen of the duct-glands becomes enlarged at the expense of the inter-glandular substance, the fine epithelium

* Ruge and Veit. Zeitsch. f. Geb. u. Gyn., 1884, vol. 6, p. 302.

with vibratile cilia is transformed, becomes stratified, flattened, then swollen, or has an epidermoidal appearance, according to the more or less rapid state of its proliferation; the glands also become coloured with greater difficulty.

Lastly, the space occupied by the gland during its growth may become fifty times as great. The proliferation of the epithelium may begin in one of the walls and gradually fill up the glandular duct, so that there only remains quite an insignificant part still covered with a single layer of epithelium; or else the proliferation commences at the same time round the whole circumference, allowing the glandular duct to remain. In other cases the latter also disappears, and all one finds in its place is a solid mass of cells. Last of all, the cellular proliferation, commencing at the same time in various points of the gland, may, by uniting, form some more or less well-marked bridges of cells, dividing the gland into two or three cavities. These glands, which are partly degenerated, hold a middle course between those which are still normal and those which are transformed into solid cylinders filled with cancer cells.

With regard to the symptoms, prognosis, and treatment, malignant adenoma is one and the same as cancer of the body of the uterus.

Cancer of the body of the uterus.—Cancer of the body is found growing in a variety of forms, which correspond to certain fairly well-defined clinical types, viz.:

I. *Cancer of the mucous membrane* {
A. *Epithelioma* (French authors), or *carcinoma* (German authors).
B. *Sarcoma* (of the mucous membrane).

II. *Cancer of the parenchyma*, or *fibro-sarcoma*, or *fibrous and sarcomatous growth.*

Primary cancer of the body of the uterus was, until a few years ago, looked upon as very rare. Gallard, in his long career,* only diagnosed two cases, and Pichot,† in 1876, was only able to collect 44 cases amongst French and English authors.

The fact is that in former days gynæcologists only very rarely

* T. Gallard, *loc. cit.*, p. 946.

† L. Pichot. Clinical study of cancer of the body and cavity of the uterus. Thesis for M.D., Paris, 1876, No. 276.

attempted an exploratory dilatation of the cervix, and never an exploratory curetting operation. Actually, owing to those valuable methods of investigation, it has been ascertained that primary cancer of the mucous lining of the uterus is much more frequent than it was formerly thought. Thus Gusserow was enabled to collect 122 cases.

As for the relative frequency of cancer of the cervix and the body, it is, according to Szukits,* in the proportion of 420 to 1. But these statistics are old. Schröder,† out of 812 cancers of the uterus, observed 28 primary cancers of the body, and Schatz,‡ in 80 cases, found 2.

I shall, in due course, describe the three forms of cancer of the body.

A. *Epithelioma (or carcinoma) of the mucous membrane.*—The German school generally gives the name of carcinoma to what the French school § now distinguishes as epithelioma. I shall use the two terms without any distinction, as they mean one and the same lesion.

One might almost call it cancer of the menopause, owing to its special frequency at that period of the genital life.

It has, as a starting-point, the transformation of the glandular metritis which I have mentioned. One has sometimes been enabled to follow this transformation step by step, in one patient, when making use of the curette at successive periods.‖

Morbid anatomy.—From a microscopic point of view there are two varieties to be distinguished. At one time one has to deal with a general villous growth, which is diffuse, involving the whole uterine cavity, presenting, when cut, the appearance of a ripe fig (figs. 205 and 206); at another there is an isolated fungus, with a more or less broad pedicle, sometimes of a polypoid form (fig. 204).

There is a remarkably small tendency in the growth to invade the mucous membrane of the cervix. This freedom of the cervix is both a difficulty in the way of diagnosis and a help in the way of treatment. The uterine wall, on the contrary, is little

* Szukits, quoted by C. Schröder, Die Krankh., &c., 10th edit., 1890, p. 377.

† See Hofmeier. Zeitsch. f. Geb. und Gyn., 1884, vol. 10, p. 269.

‡ Schatz. Handb. der path. Anatomie, 1876, p. 867.

§ Cornil. Histology of epitheliomata of the fundus uteri. (Journ. des connaiss. méd., 1889, p. 34 et seq.)

‖ Breisky. Prag. med. Woch., 1877, p. 78.

by little destroyed and eaten away, after being invaded by the deciduous growth, which is no sooner formed than it becomes disintegrated. Some metastatic nodules form at various points of the parenchyma, and even under the peritoneum ; the latter, by way of reaction, throws out some protective adhesions, which bind down the bladder and intestines to the womb. A perforation

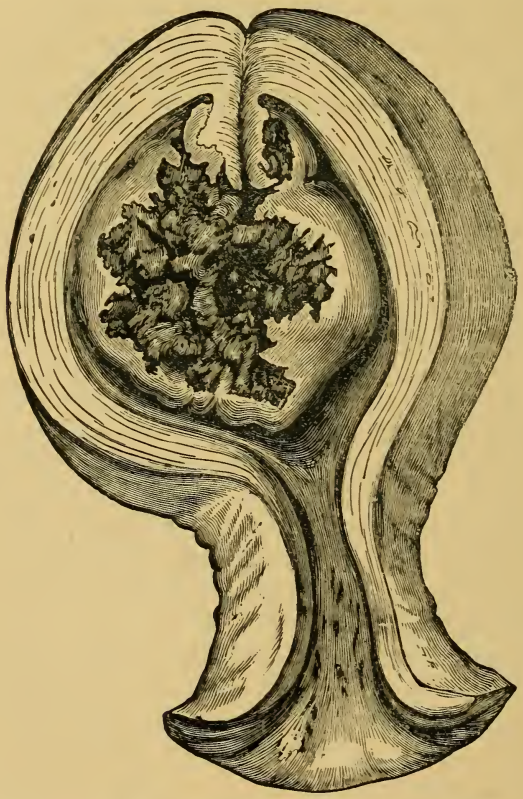


Fig. 204.—Epithelioma of the mucous membrane of the uterus. Circumscribed form.

may occasionally bring about a fatal peritonitis or some abnormal communication.

Such metastatic nodules are frequently enough observed growing superficially in the vagina, and deeply in the ovaries, the tubes, &c.

In studying their histology, one finds, according to Cornil,*

* Cornil. Lectures on the morbid anatomy of metritis, &c. Paris, 1889, p. 136.

that they consist of tubulated and lobulated epitheliomata, with the tubes most frequently very large and anastomosing, and offering the following peculiarity, that the first layer of cells found on the walls consist of regular cylinders; these cells are elongated, with highly pigmented nuclei. The next layers are formed of polyhedrical and sometimes squamous cells. The innermost ones become mucoid, get filled with granulations, and often their centre is found completely atrophied.

When one examines a section with a low power to get a view of the general appearance of the growth, one observes a quantity of alveoli with thin walls, lined with cylindrical epithelial cells

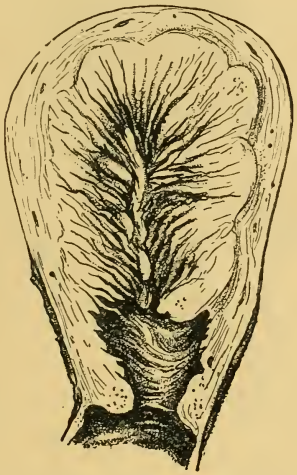


Fig. 205.—Epithelioma of the mucous membrane of the uterus. Diffuse form.

in one or two layers; one also finds some large cavities which contained, in the fresh state, a mucous fluid holding cells in suspension (fig. 207). It is easy to form an idea of the way in which these cavities become formed: the fibrous coat with which they are surrounded has some capillary blood-vessels leaving it which one can see entering the epithelial layer and becoming covered with it; these vessels increase in the epithelial layer forming papillæ; one finds them sometimes cut through lengthways, sometimes transversely, and their section is then found surrounded by cylindrical cells; there exists besides some mucous cavities in the epithelial covering; some

of the tubes, which were originally narrow, have therefore got transformed into large cavities with granulating walls.

Under a higher power one can gain a better idea of the process (figs. 208 and 209).

Along with these undoubted epitheliomatous affections one almost constantly finds the changes due to a simple chronic metritis. So it is important to examine thoroughly and not to

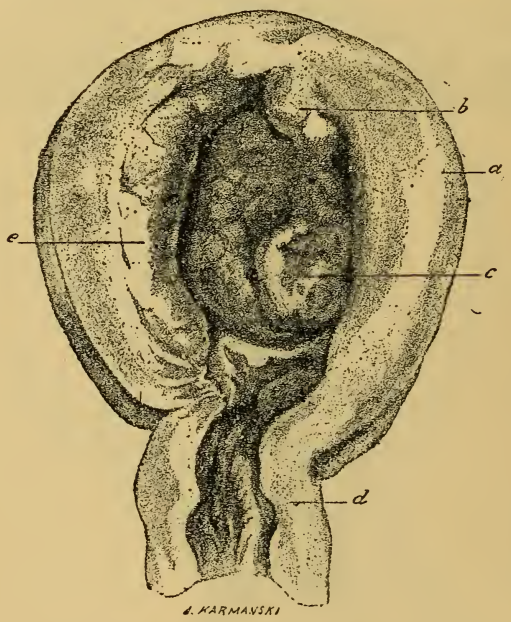


Fig. 206.—Epithelioma of the mucous membrane of the uterus. The diffuse form with circumscribed thickening.

a, muscular wall of the uterus ; *b*, *e*, section through the growth ; *c*, front view of the growth ; *d*, the cervix which is not affected.

be merely content with seeing some small fragments, for fear of committing some gross errors.

The great quantity of cylindrical cells in these tubulated or lobulated growths distinguishes these epitheliomata of the cervix and body of the uterus from the ordinary squamous tubulated epitheliomata, from those, for instance, which appear on the skin. They present, in fact, a special form in connection with the elements of the mucous membrane from which they are developed.

At a more advanced period in its evolution the cancer of the body may become ulcerated; but Cornil found in one case, quite at the beginning, that the mucous membrane was intact and pushed forward by the epithelial lobules.

The mucous membrane of the body is occasionally still to be recognised, and its epithelial cells are preserved, although covered by a few migratory cells; the glands, however, are atrophied; their cylindrical cells are quite small. The connective

Fig. 207.—Epithelioma of the body of the uterus. (Magnified 120 diameters.)

b b, lobules of epithelioma; *m*, lobules showing empty spaces which are sometimes transverse sections of vessels, sometimes cavities filled with cells undergoing mucoid degeneration; *n*, small alveoli of epithelioma; *t*, connective tissue. Almost all the epithelial cells tend to become separated from the walls of the spaces in which they are enclosed. (Cornil.)

tissue is compressed, pushed up into small heaps, and reduced in thickness. In other parts the mucous membrane is reduced to a very thin layer of connective tissue covered with a single coating of cylindrical cells (fig. 210).

Later on the muscular layers are infiltrated by the growth. It may also begin spreading towards the tubes and the ovaries.

I ought to mention, as a pathological curiosity, a case which up to the present time seems unique, that of a primary squamous-celled epithelioma of the body of the uterus. It was observed by O. Piering.*

Symptoms.—Hæmorrhage is the primary symptom, and, as in cancer of the cervix, it is generally at an early date accompanied

Fig. 208.—Epithelioma of the body of the uterus. (Under a high power.)

c, connective tissue; *d*, glandular cul-de-sac largely modified; *f*, *g*, *m*, dilated and modified glands; their epithelial coating *f* consists of cylindrical cells, but their cavity *m*, *g* is full of cells, the glandular membrane is absent; *a*, a large cavity in the midst of a collection of epithelium; the epithelial mass *b* has vessels coursing through it, starting from the nearest connective tissue as one sees at the point *v*; *m*, these same vessels cut through obliquely or otherwise. (Cornil.)

by a serous flow† which is sometimes of a reddish colour with an insipid or fœtid smell; one also at times observes that there are small shreds cast out with the appearance of having been

* O. Piering. Ueber einen Fall von alypischer Carcinombildung im Uterus (Zeitschr. f. Heilk., 1887, vol. 8, p. 335).

† Melle Coutzadrida (On hydrorrhœa and its semeiological value in cancer of the body of the uterus. Thesis for M.D., Paris, 1884) has greatly exaggerated the value of this symptom, which I have sometimes found entirely absent.

scraped off an intestine, derived from the disintegrated fungus growths.

The pains and the other functional and reflex symptoms

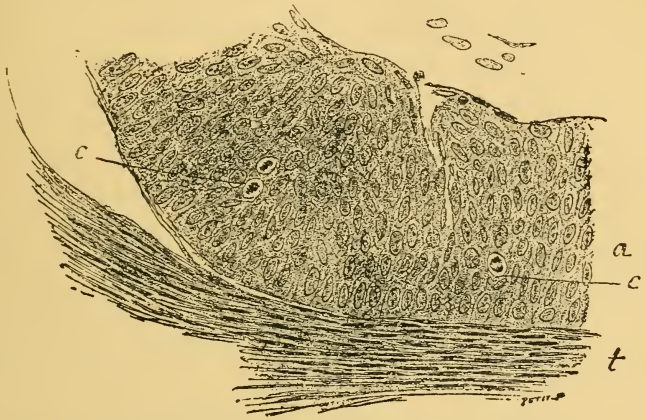


Fig. 209.—Primary epithelioma of the body of the uterus. (Magnified 300 diameters.)

a, numerous layers, containing epithelium, the lowest layer of which is cylindrical; *c*, *c*, cells undergoing karyokinèse; *t*, muscular tissue of the uterus, into which the cylindrical cells are directly embedded. (Cornil.)

remain for a long while those to which I have given the characteristic name of uterine syndroma (see chapter on

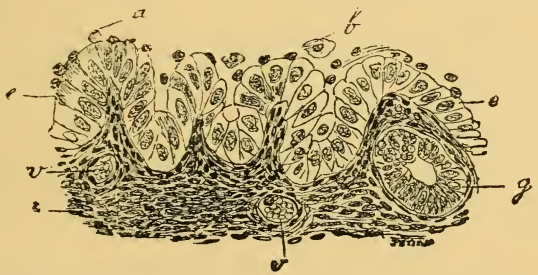


Fig. 210.—Mucous membrane of the uterus compressed and atrophied at the level of a cancer which has become developed in the deeper layers. (Magnified 300 diameters.)

e, *e*, clear mucous cells of the epithelial lining, with no vibratile cilia remaining; *a*, migratory cells situated on the surface of the epithelium; *b*, a desquamated epithelial cell; *t*, the compressed connective tissue of the mucous membrane; *v*, vessels; *g*, gland duct. (Cornil.)

Metritis). But as the disease becomes more severe the pains take on a most remarkable paroxysmal character, which is

somewhat pathognomonic. Those crises of excruciating pain, first mentioned by Simpson, have been, I believe, erroneously attributed by Schröder to the contractions the uterus is undergoing to expel its contents. They have none of the characteristics of colic, and their appearance at regular times, once or twice a day, even after the tumour has been destroyed by the curette, as I have observed, is a proof that they are more of the nature of a neuritis, occurring by propagation along the nerves of the disorganised uterus.

The examination of the uterus by bi-manual palpation shows that there is an increase in volume of the organ sometimes to the size of a four months' pregnancy. The uterus remains movable for a long time; it ends, however, by getting wedged into the pelvis, owing to the adhesions. To the touch the cervix appears normal, but frequently softened and slightly patulous like that of a gravid uterus.

The catheter, which should be used with the greatest precaution, enables one to see that there is considerable increase in the capacity of the uterus, and that there are some irregular masses present. It can occasionally be sufficiently dilated with the finger for one to feel the fungating growths in the cavity of the womb; an artificial dilatation helps to make the diagnosis more certain; it is better to produce it rapidly with a metallic dilator or Hegar's bougies, so as not to obliterate the cervix by the prolonged presence of a laminaria tent.

The general health is pulled down as the tumour goes on developing, and there is eventually cachexia.

Diagnosis.—The hæmorrhage, the serous discharge, the increase in volume of the uterus, the intra-uterine exploration, are sufficient elements to help to form an opinion. The examination of any small fragments removed by the curette may sometimes help to decide the question of its being cancer or metritis, without malignant growth. One will also be able thus to distinguish between carcinoma and sarcoma.

There are certain cases, however, where in diagnosing the disease from metritis, even with the help of the microscope, one meets with the greatest difficulties. Such are the cases where, in the presence of a whole series of the ordinary rational symptoms, especially of persistent hæmorrhage, which will not yield to the curette, one has to decide upon the nature of the

lesion by judging of the amount of resistance there is offered to therapeutic measures, and by the examination of the insignificant particles brought away by the curette. But according to Cornil's* very just remark, if the diagnosis is easy when one is dealing with an entire uterus, it is quite another thing when one has to be content with small particles of mucous membrane. A simple glandular hypertrophy of the endometrium may then be very difficult to distinguish from an epithelioma, especially when the fragments of membrane do not enable one to examine the glands in their whole depth.†

It may then be necessary for one to perform vaginal hysterectomy, having merely diagnosed what is the probable condition, and as supreme measure against persistent hæmorrhage which is putting life in danger.

One should have previously taken care to ascertain by examining the appendages that they are not implicated, as the starting-point for any hæmorrhage of a reflex character. It has sometimes been possible thus to ascertain from the portion which has been brought away that there are the characters of an epithelioma, which could not be decided from the examination of the fragments supplied by the curette. Martin and Löhlein‡

* Cornil and Brault. Notes on the lesions of chronic endometritis (Bull. de la Soc. anat., Jan., 1888, p. 57 et seq.).

† The following are the particulars which may guide one in this examination: in simple hypertrophy of the glandular tissue there often exists between the culs-de-sac and the connective tissue a very regular layer of flat cells which act, so to say, as a membrane for the implantation of the epithelium. The vibratile cells are nearly always preserved, they will be found to the very depth of the glands; the mucoid transformation of the cells is never complete, it only affects their free ends. By the side of mucoid cells are generally to be found some epithelium with its celia still intact.

The inter-glandular tissue is not so crowded with lymphatic cells as in epitheliomata, and the layers of young connective tissue are arranged quite regularly, following parallel lines in the direction of the excretory tubes.

In epitheliomata, on the contrary, there is found along with the hypertrophic lengthening of the glands an abundant multiplication of cells which are rapidly losing the character of epithelium with vibratile cilia. Owing to this proliferation, the deeper parts of the gland are very soon filled up with a collection of full-grown epithelium. On the other hand the cells may undergo mucoid degeneration, or be found polyhedrical or cubical in shape. So soon as the gland walls give way, the tumour presents the general arrangement of epithelioma or carcinoma. Cornil in P. Valat. On primary epithelioma of the body of the uterus. Thesis for M.D., Paris, 1888.

‡ A. Martin. Meeting of German naturalists and physicians. Heidelberg, 1889. (Centr. f. Gyn., 1889, No. 40, p. 690 et seq.).—Löhlein. ibid.—See also D. de Ott. Removal of the uterus through the vagina (Annal. de gyn., Oct. and Nov., 1889); p. 36 of the special edition.

have mentioned cases of this sort which are very instructive from a clinical point of view.

In doubtful cases one would be able in the same way to recognise a fibroid tumour undergoing decomposition, thanks to a microscopical examination.

The presence of a metastatic cancerous nodule in the vagina sometimes sets the whole matter clear.

The prognosis is very serious. All the same, an early operation has often been followed by a long term of life.

Fig. 211.—Sarcoma of the uterine mucous membrane.

Etiology.—This form of primary cancer of the body of the uterus is special to women who have passed the menopause; the average age of the patients observed by Hofmeier is 54 years. Out of 31 cases of malignant tumours, comprising the several varieties of cancer of the body observed by Pichot,* 9 only were under 50 years. In one case only did he observe the influence

* Pichot. On primary epithelioma of the body of the uterus. Thesis for M.D., Paris, 1888.

of heredity well marked. Nulliparæ are much more frequently affected with cancer of the cervix. 21 out of 100 of the patients observed by Hofmeier had never had any children.

B. *Diffuse sarcoma of the mucous membrane.*—Since it was first started by Virchow, the name of diffuse cancer has been given to a thickening of the mucous membrane, produced by the proliferation of round or fusiform cells with which it becomes infiltrated, producing soft, villous, or lobulated tumours (fig. 211), having an encephaloid appearance and being a reproduction of the embryonic type of connective tissue. This is the cancer of young women.

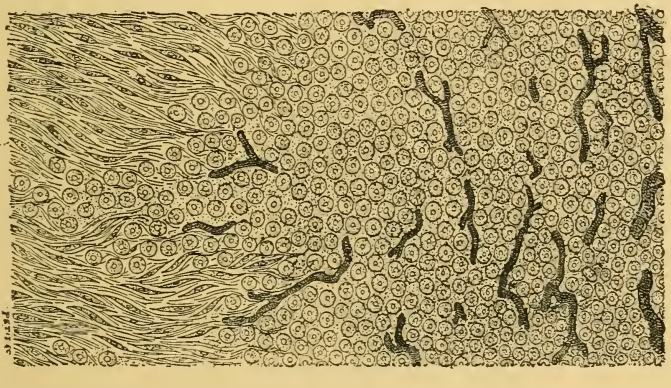


Fig. 212.—Diffuse sarcoma of the mucous membrane of the uterus. (Wyder.)

The morbid growth is separated from the peritoneum (on the left) by a well-marked coat of healthy muscular tissue, several millimetres in thickness. The superficial parts situated towards the uterine cavity (to the right) are undergoing disintegration.

In the deeper parts one sees here and there bands of connective tissue which are rich in fusiform cells with prolongations of various lengths. Between these cells is seen an amorphous substance containing a large collection of round cells, with well-marked nuclei closely packed together. In the superficial layers, the bundles of fibrous and muscular tissue completely disappear, giving place to round cells. There is a very rich blood supply to the part. Around the blood-vessels are found a few spots of hæmorrhage. There is nowhere to be found any trace of the mucous lining of the uterus, and especially there is no gland to be found.

Morbid anatomy.—I shall not dwell upon the well-known histological characters of sarcoma, as they require no special mention in this place (fig. 212). It has occasionally been observed, however, that the histological characteristics of sarcoma and carcinoma appear together, giving rise to mixed tumours, to true carcino-sarcomata (Klebs).

When the sarcoma consists of a tumour with a pedicle it may become engaged in the cervix like a polypus.* It becomes ulcerated and disintegrated much less rapidly than epithelioma. But when this has begun to take place the sarcoma may be the cause of the lining wall of the uterus being destroyed.

Abel,† as I have already said, has maintained that diffuse sarcoma of the mucous membrane of the body often coincides with a circumscribed epithelioma of the os tincæ. But he seems to have mixed up sarcoma with purely inflammatory lesions.

Symptoms and diagnosis.—The signs in more ways than one resemble those of the last mentioned form—hæmorrhage, serous exudation, increase in volume of the uterus, unimpaired cervix; the introduction of the finger after dilatation will also enable one to recognise the growth.

The clinical characters which distinguish sarcoma from epithelioma are specially, the slightest fœtid smell about the discharge during the first period, the ulceration which only comes on later, the slightest dilatation of the cervix, the possible appearance of a polypoid tumour pushing it open and descending into the vagina, occasionally causing inversion of the uterus.

As for the means of diagnosing it from other affections, the last chapter should be consulted.

Prognosis.—This is most serious. Recurrence of the sarcoma is fatal, even when operated‡ on at the very commencement (Freund).

Etiology.—One of the most remarkable characteristics of this growth, which distinguishes it from epithelioma, is the age at which it attacks patients. There are numerous examples of it in women under twenty years of age. Zweifel§ has reported a case of hysterectomy performed for a sarcoma of the uterus in a

* P. Munde. Myxo-fibromata of the endometrium. (Obst. Soc. of New York in Amer. Journ. of Obstet., 1885, vol. 18, p. 63.)

† K. Abel, *loc. cit.*—See for the same subject a contradictory article by E. Fraenkel, (Arch. f. Gyn., 1888, Bd. 33, heft. 1, p. 146), an important discussion at the Gyn. Soc. of Berlin, July 13, 1888 (Centr. f. Gyn., 1888, No. 46, p. 753 et seq.).—Lastly, a long article by Thiem. Meeting of German naturalists and physicians. Cologne, Sept. 23, 1888. (Centr. f. Gyn., 1888, No. 47, p. 762.)

‡ Freund. Meeting of German naturalists and physicians. Heidelberg, 1889 (Centr. f. Gyn., 1889, No. 40, p. 693).

§ Zweifel. Drei Fälle von vaginaler Totalexstirpation des Uterus, &c. (Centr. f. Gyn., 1884, No. 26, p. 407).

young girl aged thirteen years, and Kaltenbach* in a young girl aged fifteen years. It is especially frequent in nulliparæ. The first stage which it seems to go through in its development is that of interstitial endometritis; since this latter is frequently observed in the body of the uterus whilst the cervix is affected with epithelioma, one can well conceive that endometritis is easily transformed into epithelioma; hence, according to Abel, although his opinion is much contested, the frequent co-existence of these two different growths in the womb.

C. *Sarcomatous fibroids.*—Synonyms: sarcoma fibrosum seu nodosum, circumscribed fibro-sarcoma, sarcoma of the uterine parenchyma.

Morbid anatomy.—One might, from a clinical point of view, call these growths malignant fibroid tumours. Just like the non-malignant varieties, the fibro-myomata, they may be sub-mucous, interstitial, or sub-peritoneal. Like these latter, they start growing from the uterine parenchyma, but, a point of capital importance, instead of forming more or less isolated masses with a loose capsule, they have their roots firmly fixed into it. A cut section presents a pale surface; their consistence is soft and homogeneous. Their pedicle, if they have one, is fibrous, and it is evident that they are the outcome of the degeneration of a fibro-muscular polypus. The remains of an original benign growth are often to be recognised in sessile tumours, but the characteristic tissue of sarcoma (accumulation of round and more rarely fusiform cells) has but a few rare connecting stromata left coursing through its substance. All the same, it is extremely probable that a fibro-sarcoma has always had a fibro-myoma for generative tissue. This degeneration has often been found in actual process, and some of the cases observed by Chrobak, G. Müller, A. Simpson, Frankenhäuser, and de Kurz† are remarkable examples.

Some distant metastatic nodules have been found in the vagina, the peritoneum, the liver, and the vertebræ.

The transformation of the fibro-sarcoma into myxo-sarcoma,

* Kaltenbach. Erfahrungen über Uterussarkom (Centr. f. Gyn., 1890, p. 131, supplement).

† Chrobak. Arch. f. Gyn., 1872, bd. 4, p. 549.—G. Müller. *Ibid.*, 1874, bd. 6, p. 126.—A. R. Simpson. Contributions to Obstet. and Gyn., p. 240.—Frankenhäuser, quoted by A. Rogivue. On Sarcoma of the Uterus. Thesis for M.D., Zurich, 1876.—Kurz. Deutsche Zeitschr. f. prakt. Med., June 16, 1877.

into cystic sarcoma, and other mixed tumours is exceedingly rare,* and I shall merely mention here a very interesting observation of Gusserow's,† relating to a myxo-sarcoma with sarcomatous metastatic nodules in the peritoneum, and another of Rabl-Rückard's,‡ in which there was a combination of carcinoma and fibro-sarcoma; the supporters of R. Maier's § theory might even find here an example of the direct transformation of sarcoma into carcinoma.

Symptoms.—In the beginning there is nothing to distinguish a fibro-sarcoma from a non-malignant fibroid. There is hæmorrhage in the shape of menorrhagia or metrorrhagia; serous oozing, a sort of non-odorous hydrorrhœa; a moderate amount of pain; increase in volume of the uterus. The physical phenomena are those of a non-ulcerated tumour, which can be reached by dilatation if it is sub-mucous.

Later on, the growth becoming ulcerated, the scene changes. The hæmorrhage becomes one almost continuous oozing of blood; the leucorrhœa acquires a fœtid odour, and contains some rice-shaped *débris*, in which the presence of sarcomatous tissue is detected with the aid of the microscope. The pains become worse and may be paroxysmal in character, appearing at regular times, as I mentioned in dealing with sarcoma of the mucous membrane. A local examination will permit the finger to pass the cervix without injury if it has been dilated, to feel the friable mass of the disease, which sometimes protrudes spontaneously between the lips of the os tincæ. The body of the uterus may be much increased in volume and nodulated. It is sometimes retroverted and becomes immovable during the last period. Inversion of the uterus has even been seen as a consequence of sarcoma (Simpson). Last of all the cachexia becomes more and more marked.

This second phase is frequently preceded by a temporary relief of the pain, brought about by the removal of the sarcoma, which has been taken for a fibroid. Even during the operation suspicion may have arisen as to the nature of the tumour, owing to its complete fusion with the neighbouring tissue, which made

* O. Terrillon. Sarcoma of the Uterus (Bull. et Mém. Soc. Chir., 1890, t. 16, p. 746). This author has, however, observed three cases of cystic sarcoma of the uterus.

† Gusserow, *loc. cit.*, p. 163.

‡ Rabl-Rückard. Beitr. zur Geb. u. Gyn., 1872, t. 1, p. 76.

§ R. Maier. Virchow's Arch., 1877, bd. 70, p. 378.

its enucleation impossible. A rapid recurrence at the spot clears away all doubt; it is owing to this characteristic that the English surgeons have given the tumour the name of recurrent fibroid.

Freund has noticed a curious case of fibro-sarcoma of an uterus with a septum, which brought on hydrometry.

Diagnosis.—It may be suspected from the rational and general signs, but it will be made out for certain by examining the tumour with the finger introduced rather deeply, after dilatation at the commencement if necessary. One may hesitate between a hæmorrhagic metritis and a fibroid tumour, later on between a sphacelous fibroid and an epithelioma or sarcoma of the uterine mucous membrane. The microscope will be most useful in the examination after curetting.

The total duration of the disease will vary from four months (Frankenstein's case) to ten years (Hegar's case). The average, according to Rogivue, will be three years.

The prognosis, which is always serious, will vary in degree; the prompt recurrence is especially noticed in young subjects, and in tumours which have been rapid in their growth.

Etiology.—After collecting all the cases published up to 1885, Gusserow made out the following table, which shows the influence of age :—

Before 20 years	... ...	4 cases	
Between 20 and 29 years	...	5 ,,	
,, 30 ,, 39 ,,	...	15 ,,	
,, 40 ,, 49 ,,	...	28 ,,	
,, 50 ,, 60 ,,	...	18 ,,	
Above 60 years	... ...	3 ,,	(one of which was 72)

This table clearly shows the disposition, brought about by the menopause, to sarcoma as to any other malignant growth.

Out of 74 cases gone into by the same author, as regards sterility and fecundity, there were 25 sterile women (4 of which were virgins). This figure seems very high, and is a contrast to what I have said about the predisposition of multiparæ to cancer of the cervix.

Treatment of cancer of the body of the uterus.—There is no distinction to be made as regards the treatment between the histological varieties of cancer of the fundus. What follows

therefore applies to epithelioma (or carcinoma) as well as to sarcoma.

The indications are the same as for cancer of the cervix: to do a radical operation whenever there is any hope of removing all, and when the seriousness of the operation is justified by the great benefit which is expected to follow. In the opposite case one should be content with a palliative treatment.

The special form of curative treatment to be chosen is vaginal hysterectomy. One should try and perform it as soon as possible, so as to prevent the excessive growth of the uterus. Schröder,* in fact, lays down as a rule that the only uterus which should be generally removed by the vagina is one which does not exceed the fist in point of size. One might, it is true, go beyond this limit by removing it in small pieces, but when one has to deal with a cancerous uterus, the operation done in this way exposes the woman to chances of infection which are too great for the operation to be looked upon as a good one. It is to be observed that the vaginal operation is rendered much easier by the presence of a healthy cervix which can be firmly held and which will not infect the wound, hence the excellent results one may obtain after some operations.†

Should the uterus be too large for it to be prudent to try the vaginal operation, one might (if one does not prefer undertaking a course of energetic curetting and cauterisation) have recourse to hysterectomy by the sacral method which I have described in the preceding chapter. It is still too new for us to be able to form a correct appreciation of it.

Up to the present, when the uterus has been too bulky for removal through the vagina, one has most often resorted to an abdominal incision.

Two series of events may thus be brought about:

First, the cervix has remained healthy; the fundus only will

* Schröder. Die Krankh. der weibl. Organe. 7th edit., 1886, p. 319.

† Routier. French Congress of Surg., 1888, t. 2, p. 386, and Bull. et Mém. Soc. de Chir., Nov. 1888, p. 841.—Terrillon (Répert. univ. d'obst. et de gyn., 1889, p. 351) has reported three cases of hysterectomy for malignant tumours, followed by cure.—P. Segond (Bull. et Mém. Soc. Chir., Nov. 1891, p. 688) out of eight cancers of the body of the uterus, has had no death from the operation. Six cases date back from one year; two were operated on in August, 1891.—Terrier, *ibid.*, p. 666) has operated on two cancers of the body, with one death from the operation; the patient after her cure lived two months and a half.—Bouilly (*ibid.*, Dec. 1891, p. 710) out of two cancers of the body had two deaths (patients operated upon *in extremis*).

then be removed, the cervix being left behind as a pedicle; in a word, one will have performed supra-vaginal hysterectomy (not to be mistaken for total hysterectomy). Unfortunately the cervix uteri will present too short a pedicle for one to be able to fix it externally. It will therefore be left in the abdomen after being sutured according to the method described by Schröder for hysterectomy applied to myomata. But one should ascertain for certain beforehand that it is intact, and even curette and cauterise the mucous membrane with the thermo-cautery.

Abdominal hysterectomy applied to cancer of the uterus in Schröder's hands was followed by 4 deaths in 13 patients, or 30·77 per 100.*

Rapid recurrences seem at first sight much to be dreaded, for the section through the cervix must necessarily be very near the diseased tissues. Yet out of the 11 patients cured by Schröder 3 only succumbed to a recurrence in the course of the first year, 4 were still cured after more than 2 years, and 2 after 5 years. In his last edition (10th edition, 1890) Schröder mentions two cures dating one 5 and the other 7 years back, which evidently belong to the same series with a longer period of observation.

Secondly, if, with an enlarged uterus, one had to deal with a diseased cervix, one would no longer perform supra-vaginal hysterectomy by means of laparotomy, but total extirpation through the abdomen, or Freund's operation.†

This operation was at first indiscriminately applied to all cancers of the cervix and the body. It is only its frightful mortality which caused it to be given up and a new method to be looked for, leading to the adoption of the vaginal one, which is incomparably less serious. Freund's operation, such as it is actually practised, is after all merely a return to an operation proposed by Delpech‡ as early as 1830 (combination of the hypogastric and vaginal methods). Freund's typical operation, the one he described in his first works, is no longer practised by the author himself, without the modification proposed by

* M. Hofmeier. Zur Statistik des Gebärmutterkrebses, &c. (Zeitschr. f. Geb. und Gyn., 1884, t. 10, p. 280).

† W. A. Freund. Eine Neue Methode der Exstirpation des ganzen Uterus (Samml. klin. Vortr., No. 133, p. 912) et Centr. f. Gyn., 1878, No. 12, p. 265.

‡ J. Delpech. Arch. gén. de Méd., 1830, 1st S., t. 24, p. 299.

Rydygier* (in imitation of Delpech), and which consists in completely freeing the cervix from the vagina to begin with before opening the abdomen.

This is how the operation is performed when thus perfected :

The patient should be placed so that her head and the upper part of the body are lower than the pelvis. She should have been prepared in the way described for vaginal hysterectomy.

The 1st and 2nd stages of this operation are gone through. Then one places an iodoform tampon in the vagina and one does the laparotomy.

3rd stage. Opening of the belly.—An incision should be made commencing at the umbilicus and reaching to within two fingers' breadth of the pubis; it is as well, for preventing any tearing, to place a provisional suture *en masse* through the abdominal walls on either side of the inferior angle of the wound. Should the abdominal wall be very rigid, one may divide the insertion of one or both recti muscles on a level with the pubis. Crédé† has ventured upon a very bold manœuvre with the object of getting plenty of room; at the commencement of the operation he resected a part of the pelvic wall.

The intestines, whose tendency to be drawn up will be increased by the sloping position of the patient, should be pushed towards the diaphragm with compress-sponges; should it be absolutely impossible to get a clear view of the parts one may resort to evisceration, that is, taking a part of the intestines out of the abdominal cavity for a few moments and laying it on the abdominal wall, where it has to be kept warm and moist by a frequently renewed covering of compress-sponges.

4th stage. Ligature and section of broad ligaments.—The uterus is seized with Museaux's forceps and dragged firmly upwards. Freund then successively ligatured the broad ligaments in three parts. To pass the inferior ligature which had to surround the uterine artery he generally used a sort of trochar-needle, whose point could be pushed out of the canula, and was afterwards hidden in it by means of a spring. But since the operation is begun through the vagina the manœuvre

* Rydygier. Berl. klin. Woch., 1880, No. 45, p. 642.

† B. Crédé (of Dresden). Eine neue Methode der Exstirpation des Uterus. (Arch. f. Gyn., 1879, t. 14, Heft 3, p. 430)

is very much simplified, because the uterine vessels can be ligatured through it. These preliminary stages have, besides, the enormous advantage of enabling one to avoid the ureters with more certainty since they become freed, and tend naturally to move upwards when one is dissecting the cervix of the uterus by dragging it downwards. It is also possible to get a sight of them after opening the belly.

The uterus, which can be conveniently pulled out of the wound, may be detached "like a tumour." As a preliminary step, Bardenheuer places isolated ligatures on any vessels of importance which are easy to recognise in the broad ligaments, and only cuts these ligaments after ligaturing them.

The womb should be separated from the bladder with the greatest precaution after incising the peritoneal cul-de-sac.

The ovaries should be removed in young women.

5th stage. Dressing.—One should, it seems to me, just like after a colpo-hysterectomy, suture the stumps of the broad ligaments to the edges of the narrowed vaginal incision with two stitches, wash out the peritoneum, close the abdominal wound, and place some iodoform gauze in Douglas' pouch and in the vagina.

Freund prefers to close the vaginal wound carefully by uniting the peritoneum above it with sutures; he brings the threads back through the vagina and exerts a greater amount of traction upon those holding the upper portions of the broad ligaments, thus inducing their inversion and forming a nucleus of cicatricial tissue which will take the place of the uterus between the bladder and rectum.

Bardenheuer* makes use of an excessively complicated mode of drainage, the type of which he has varied several times; the most recent form he used consisted of a vaginal tube with three bores, the middle one of which was not fenestrated, and which communicates with four branches that have to be thrust into the peritoneum; one of these can be brought back into the abdominal wound.

Martin recommends a modification of the operation which I have just described by removing first the fundus by a laparotomy, then the cervix through the vagina.† He has performed this

* Bardenheuer. Die Drainirung der Peritonealhöhle, Stuttgard, 1881.

† A. Martin. Path. und Ther. der Frauenkr., p. 320.—Albert Sippel. Eine

operation three times; he had two deaths, and the patient who recovered died from recurrence in the course of the first year.

The operation for total extirpation is undoubtedly one of excessive gravity. The statistics presented by Hegar and Kaltenbach in 1881 consisted of 93 cases with 63 deaths, that is, a death-rate of 67·73 per 100. In the last edition of their work (1886),* they brought the numbers up to 119 operations, with 80 deaths, that is, 67·2 per 100. Besides these were four unfinished operations, and one where the result is unknown; all these five should be counted amongst the deaths.

The recurrence is frequently rapid, and is always almost certain. The preceding authors only know a single case of permanent cure, in a patient operated on by Freund in 1878. In every case where it has been possible to follow up the case, the recurrence has been seen coming on after a longer or shorter interval.

Total extirpation through the abdomen is therefore a most formidable operation, and is of doubtful benefit. Should not this suffice to make the surgeon hold back? For my part, in cases where vaginal hysterectomy would not appear possible, I should prefer resorting to the sacral method.

Lastly, whenever the limits of the uterus have been overstepped, one will have to be content with a palliative treatment, curetting, followed by the actual cautery (see the chapter relating to the treatment of cancer of the cervix).

Excessive importance should be attached to having the cavities of the vagina and uterus perfectly aseptic. The products of the disintegration of the disease only having a somewhat incomplete issue through the cervix, remain in the cavity and are the cause of putrid fever. I have had the opportunity of seeing patients who appeared perfectly septicæmic, come back to life, so to say, after a thorough cleansing with the curette, an antiseptic tamponnement with iodoform gauze, and a persistent course of intra-uterine irrigations. Several of these cases have found their place in my brother, Adrien Pozzi's Thesis.†

Freund'sche Totalexstirpation (Centr. f. Gyn., 1889, No. 49, p. 844). This author has recently had success from this combined method.

* Hegar and Kaltenbach, 3rd edit., 1886, p. 453.

† Adrien Pozzi. Treatment of Cancer of the Uterus. Thesis for M.D., Paris, 1838.

A solution of the sublimate, even 1 in 5000, presents some dangers here, on account of the large absorbing surface. It is therefore always necessary, after using it, to irrigate the parts with filtered or boiled water, which is merely aseptic. For a thorough disinfection, I have found great advantage from using permanganate of potash (in a cherry-coloured solution). For deodorising purposes this can be followed by injections of Labarraque's fluid, or Pennès' vinegar (one or two spoonfuls to the litre).

I cannot insist too much upon the great benefit to be obtained, in cases of acute septicæmic intoxication, from dressing the cavity of the uterus with strips of iodoform gauze, which should remain in place for 24 to 48 hours. It is an energetical and rapid means of disinfection. This antiseptic tamponnement of the uterus has been recommended by Fritsch,* both as an antiseptic and a hæmostatic when a cancer has been removed with the curette.

* H. Fritsch. Die Krankh. der Frauen, 1886, p. 77.

BOOK VI.

DISPLACEMENTS OF THE UTERUS.

General observations on the statics of the uterus.—Classification of the uterine displacements—Historical sketch.

THE uterus is firmly fixed posteriorly by the utero-sacral ligaments, which have their unelastic and resisting fasciculi attached on a level with the cervix. Its connections anteriorly with the bladder, and laterally with the broad and round ligaments, are of much less use in sustaining it than in directing it, if one may so speak, and maintaining it in its position of anteflexion, which it preserves as a relic of the state it was in during fœtal life.* The tonicity of the pelvic floor, the only weak point of which disappears as soon as the vagina is normally closed, prevents the intra-abdominal pressure from being exerted in the way of weight; it remains even over its whole surface, and the uterus floats, as it were, apparently suspended in the midst of the pelvic organs, which provide it on all sides with small elastic cushions. One can easily account for this peculiarity in the statics of the uterus when one depresses it artificially. Up to the moment when the utero-sacral ligaments are put on the stretch and resist any further descent, the uterus yields to traction with the gentle resistance of a body floating in water.

The bladder, when full, pushes the womb upwards and backwards, causing its anteflexion temporarily to disappear; this, however, returns, and is exaggerated as soon as the bladder is emptied. The rectum, when full, pushes the uterus directly

* The knowledge of this normal anteflexion is of somewhat recent date; it is due to Velpeau and his pupils. Velpeau. Bull. de l'Acad. de méd., 1849-50, vol. 15, p. 72.—L. Piachaud. The deviations of the uterus in its empty state. Thesis for M.D., Paris, 1852.—C. F. Boullard. A few words about the uterus. Thesis for M.D., Paris, 1853, No. 87.

forwards and upwards, but in the normal state this is rarely sufficiently pronounced to be noticeable. It is not the same with the bladder, and social habits, which quickly become organic habits, tend to exaggerate it.

On the whole, the uterus has one single point where it is pretty nearly fixed, that is at the insertion of the posterior ligaments. As this occurs on the level of the point where the organ

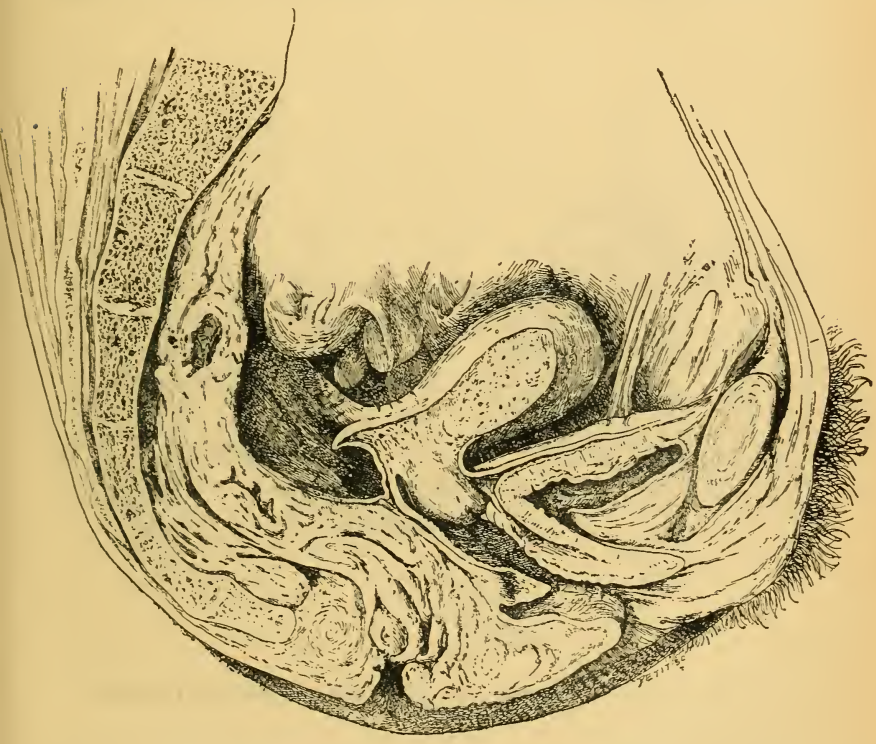


Fig. 213.—Position of the uterus, the bladder being empty.

is the thinnest, one sees that it nearly gives one an instance of a pyramid placed upon its apex. This paradoxical situation is not to be found in animals. It is to be explained by the attitude peculiar to the human race, which constitutes an anomaly in the animal kingdom.

If one considers the extensive changes in volume, shape, and consistence which the uterus undergoes during each pregnancy;

the alterations and lesions which labour may cause to the neighbouring organs, ligaments, muscles, serous membranes; and, lastly, the influence which efforts of all kinds may exert upon an equilibrium which is so unstable, one will be surprised, not at displacements of the uterus being so frequent, but at their not being still more so.

I shall first of all describe the displacements which affect the vertical planes, which have been named deviations, and consist

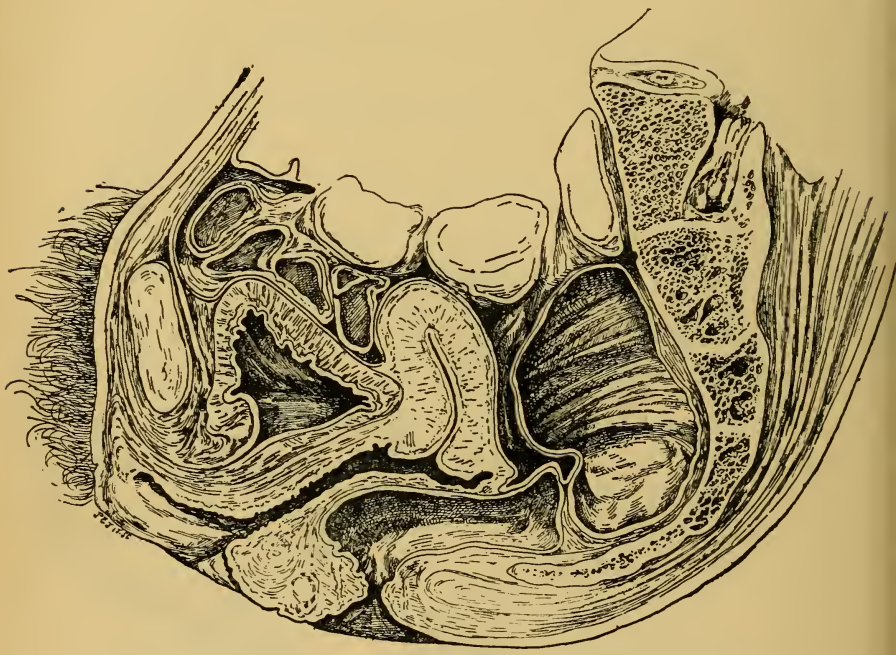


Fig. 214.—Position of the uterus, the bladder being moderately full (Waldeyer).

of flexions and versions; then I shall deal with those affecting the horizontal planes, elevation, depression or prolapsus, inversion.

Division.—The displacements of the uterus are usually divided, according to the vertical planes, into versions and flexions, depending upon whether the organ as a whole, or the body alone, is deviated and hence bent upon itself. There is an ante- and a retroversion, an ante- and a retroflexion, a lateroversion and a lateroflexion. These latter are very rare in their simple

form, but are often found in combination with the former ones. I shall not do more than merely mention them here. When the uterus is displaced *en masse* either forwards or backwards, it is called ante- or retroposition. These words have but a descriptive value, and are in no way nosological.

Historical sketch.—The history of deviations of the uterus has passed through successive phases. Unrecognised by Récamier, at a time when the principal part played by diseases of the womb, unaccompanied by any neoplasm, was attributed to prolapse, relegated to the second rank by Récamier and Lisfranc in favour of ulcerations, versions and flexions eventually were given the first place in uterine pathology by Velpeau.* Their importance was then considerably exaggerated, until the time came when Gosselin † brought about a reaction in favour of metritis. At the present moment, gynæcology, having become more analytical, although more eclectic, tends to give each of these morbid conditions the place which is due to it; it also brings in elements which are new, or have been ignored up to the present, resulting from the morbid condition of the annexes.

It is now well recognised that deviation of the uterus does not constitute by itself a disease, but is merely one factor, or rather a co-efficient of a complex morbid state, in which the displacement takes but a variable part. There is not a single gynæcologist who has had the opportunity of observing any marked displacement in a woman who did not present besides some other symptom of disease. Certain authors,‡ taking this incontestable fact as a basis, have not hesitated to state decidedly that deviations take no active part whatever in producing disease. This is going from one extreme to another. If the deviation is not a disease in itself it induces a particularly vulnerable condition in the displaced organ, resulting from the troubles of the circulation, due to increased venous tension and

* One ought merely to mention the work brought out anteriorly to this by Hervez de Chégoin. On some of the displacements of the womb and on the pessaries most suitable for curing them. (Mém. de l'Acad de méd. de Paris, 1833, vol. 2, p. 139.)

† Gosselin. Arch. gén. de méd., 1843, vol. 2, p. 129.

‡ J. Matthews Duncan. Clin. lectures on the diseases of women, London, 3rd edit., 1886 (Lectures 44 and 45).—Vedeler (Arch. f. Gyn., 1886, Bd. 28, heft 2, p. 228) maintains that retroflexion only has an anatamo-physiological interest, and by no means an anatomo-pathological one. Out of 313 cases of retroflexion, 40 women out of 100 presented no morbid symptom, and out of 60 patients the troubles to be dealt with were attributable to the nervous state, to gonorrhœa, &c.

the disordered nutrition which may result; * it favours and keeps up any inflammation in the cavity and on the surface of the uterus.

Besides, the prolapse of the annexes, which often share in the inflammation of the uterus, may be the source of reflex nervous troubles, which have an influence to be taken into account, especially in backward deviations. Lastly, the adhesions, sometimes due to consecutive peri-salpingitis, by fixing the womb in a faulty position, have still more painful results.

It follows, from what has been said, that the idea of uterine deviation, which was formerly simple, and was merely looked upon from an anatomo-pathological point of view, actually includes under one single clinical denomination the most complex elements, which have to be borne in mind during treatment quite as much, and often even more, than the changes in the axis of the organ. Such are, for instance, metritis, prolapse of either healthy or inflamed annexes, peri-salpingitis, and lastly, and in a great measure especially in the beginning, an excess of mobility in the uterus, due to laxity of the ligaments.

* Mary Putnam Jacobi. Notes on uterine versions and flexions (Amer. Journ. of Obstet., 1888, vol. 21, p. 225).—This article contains some interesting observations, although occasionally lapsing too much into theory, on the pathogenesis of deviations and the pathological physiology of the disturbance they produce.

CHAPTER I.

FORWARD DEVIATIONS.

I.—Anteversion.

Morbid anatomy. Etiology.—Symptoms.—Diagnosis: from fibroids; inflammatory or sanguineous exudation; anteflexion.—Treatment.

Morbid anatomy. Etiology.—The normal curve of the uterus coincides fairly accurately with the curvilineal axis of the pelvic purlin. In anteversion this curve is relieved, and the organ falls forwards, lies behind the pubis, on the bladder; the cervix is carried directly backwards (fig. 215). The uterus is then generally increased in size owing to a certain amount of metritis. One often finds there is some exudation from the perimetritis near either one or the other pole, sometimes in front on a level with the fundus, sometimes behind on a level with the cervix, helping to keep the uterus fixed in its faulty position.

The great cause of anteversion is to be found in the changes of structure of the uterus, after confinement or abortion, and in vicious involution brought about by some slight infection; the organ acquires the position when it is still malleable, and retains it because its normal tonicity has not returned; lastly, it becomes fixed by peritoneal adhesions.

The weight of a tumour may also determine the deviation, which is then nothing more than one in a sequence of phenomena.

Symptoms.—Uterine syndroma, which I described in dealing with metritis, may here be come across again with all its characteristics. More especial attention should be given to vesical and rectal tenesmus, which are exaggerated by the pressure of the fundus and the cervix of the uterus, but which are often absent, and may, besides, be found in cases of simple

metritis; difficulty in walking, reflex nervous phenomena, are common to all deviations, and may be attributed, no doubt, to the mobility of the uterus and to the enteroptosis which results, more than to the displacement of the womb; this is well proved by the efficacy of keeping the womb immovable by a pessary or a belt.

Diagnosis.—By means of bimanual palpation the diagnosis is rendered quite easy: the vaginal finger should search for the cervix very far back, near the posterior cul-de-sac, then passing forwards it will feel the body through the anterior cul-de-sac, and can make out its whole anterior surface, whilst the hand placed on the pubis examines its posterior wall, which is lying

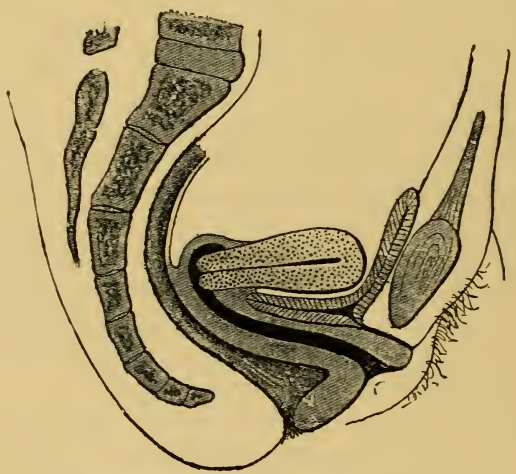
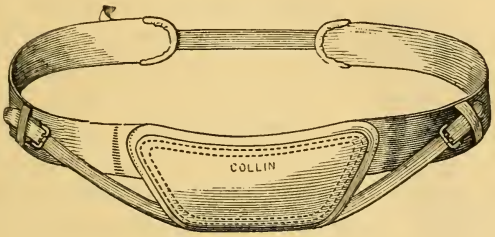


Fig. 215.—Anteversion of the uterus.

horizontally. The passing of a catheter is difficult and is not generally necessary. It should only be resorted to if there is any doubt as to the nature of the tumour found in the anterior cul-de-sac, and if one cannot decide whether one is dealing with the fundus of the uterus or a tumour growing upon it; a fibroid, inflammatory or sanguineous exudation. Anteflexion should be recognised by the bend found on the level of the union of the neck with the body. To facilitate the entrance of the sound into the os tincæ, one may seize the anterior lip with a pair of vulsellum forceps, and bring down the organ very gently. Useful information will be obtained in such cases by the rectal

tactus, since one will be enabled to know whether the body of the uterus is in its normal position or not.



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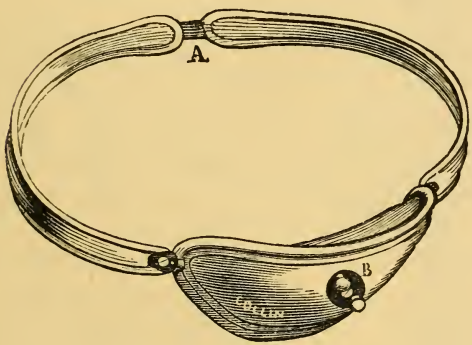

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Fig. 216.—Hypogastric belt with elastic spring (Pajot).—2. Hypogastric belt with movable plate with double action (Collin).

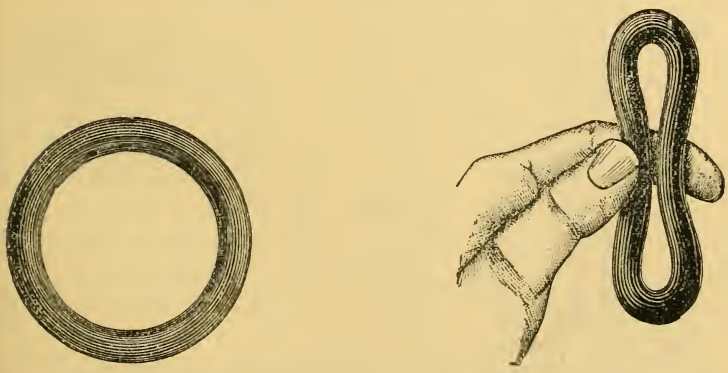

Fig. 217.—Ring pessary, named after Dumontpallier (or de Mayer).

Treatment.—It is the metritis which causes and keeps up the anteversion, so it should receive one's first attention. One

should ascertain that there is no acute inflammation going on round the uterus, or in the neighbourhood of the tubes, before beginning any energetic treatment of the uterine mucous membrane. One should begin by getting rid of the metritis by the appropriate means, amongst which very hot vaginal douches, glycerine tampons, frequent hip baths, and repeated blistering of the lower abdomen, form the first rank. When every acute symptom has disappeared, one will make use of the curette, followed by injections of perchloride of iron, according to the rules which have already been laid down.

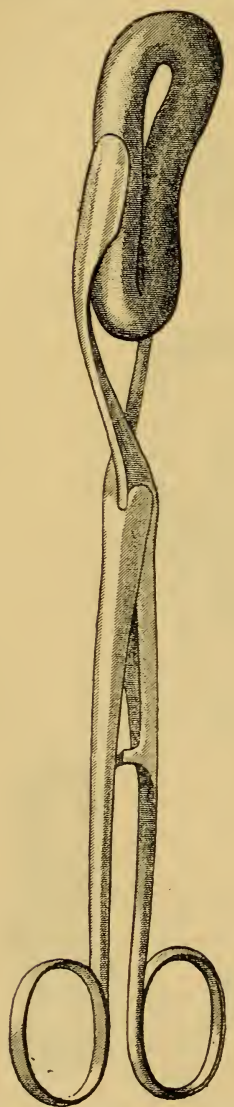

Fig. 218.—Forceps for introducing Dumontpallier's ring pessary.

One ought not to attempt to perform reduction, since the position of the organ is a simple exaggeration of the normal state. If in spite of the complete disappearance of the metritis the pains still continue, they can only be due to certain reflexes having their source in the laxity of the ligaments and the enteroptosis. One has therefore to try and fix the organ, and maintain it in its place. For this it can be dealt with in two ways, either through the abdominal walls or through the vagina.

The best belt for the forward deviations is the hypogastric belt with a movable pad, which is made to bend forwards either by the action of an elastic band, or by tightening a screw, after it has been fixed above the pubis (fig. 216, 2).

The best pessary for dealing with anteversion is one found under the category of those which I call indifferent pessaries, which are capable of being adapted indifferently to all cases, be-

cause their principal, if not their only function, is to distend the vaginal culs-de-sac, and consequently to render the uterus immovable on account of its neck being firmly grasped. The pessary named after Dumontpallier (in other countries called Mayer's pessary), consisting of a ring made of elastic caoutchouc is pre-eminently an indifferent pessary; it is easy to apply, to remove, and to clean. A pair of forceps has been made to

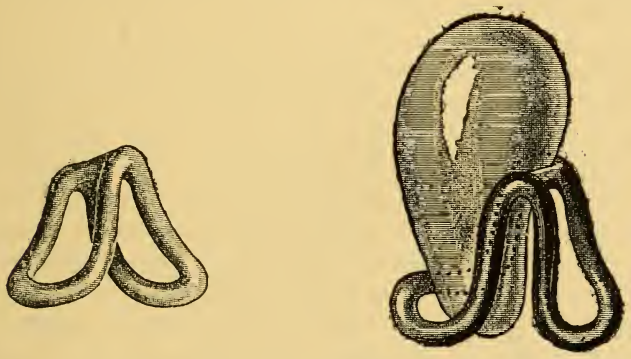

Fig. 219.—Graily Hewitt's cradle-shaped pessary.

enable one to introduce it into the vagina without pain (fig. 218); with a little skill the same result may be obtained by bending it between the thumb on one side, and the index and middle fingers on the other (fig. 217). It is found easier to place it

A B

Fig. 220.—A, G. Thomas' pessary.—B, Galabin's pessary for anteversion.

when the woman is in the lateral or the genu-pectoral position. One has merely to get the upper portion of the pessary into the posterior cul-de-sac, and then to leave it to itself, just pushing the anterior portion so that it drops into its place automatically. In choosing it the question of its size will depend upon that of the vagina. A pessary causing no injury to the patient

may quite conveniently be left in place for two or three months; it is no impediment either to coitus or to fecundation. After that length of time it should be withdrawn so as to be cleaned in a carbolic acid solution, and the patient is recommended to go without it for a few days so that it may merely be put back if it seems still to be of use.

Several special forceps have been invented for anteversion, and much has been said in their favour. I must confess that I have never derived the slightest advantage from them.

I give here some figures showing the method of application of Graily Hewitt's cradle-shaped pessary. The use of Thomas' pessary (fig. 220, A) will be more easily understood by referring a little farther on to the figures relating to the use of Hodge's pessary in retroflexion; in fact, this pessary is applied like one of Hodge's, from which it merely differs by having a movable piece shaped like a horse-shoe, which passes in front of the cervix to support the body of the uterus.

Galabin's pessary (fig. 220, B) has its anterior portion made very broad, so as to answer the same purpose.

I merely mention the general treatment which has to deal with the anemia and the nervous excitability; preparations of iron, of quinine, and hydrotherapy will be especially useful.

II.—Anteflexion.

Morbid anatomy. Etiology.—Symptoms.—Diagnosis of the variety.—Diagnosis from fibroids, inflammatory induration, vesical calculus.—Treatment of acquired anteflexion. Treatment of the metritis: curetting, amputation of the cervix. Sagittal discision of the cervix. Treatment of congenital anteflexion. Reposition. Dilatation. Pessaries. Castration.

Morbid Anatomy. Etiology.—Anteflexion is an exaggeration of the normal forward curve. For a long while before this was thoroughly recognised, certain uteri in perfect position were looked upon as organs which were morbidly displaced. It is difficult to draw a sharp line between the physiological state and the morbid state; one may, however, say that the latter commences when the angle of flexion is perceptible to the exploring finger like a sharp elbow.

Gaillard Thomas distinguishes three varieties (fig. 221):

1. *Flexion of the body.*—The body is bent upon the neck, which is in its normal situation. This is the ordinary type.

2. *Flexion of the neck.*—This is the reverse of the preceding one.

3. *Flexion of the neck and body.*—When the two segments of the uterus are bent one upon the other.

As regards the etiology, there are two sorts of anteflexion, congenital and acquired.

In early infancy, as in the fœtal life, the curve of the organ is exaggerated, the body being small compared to the cervix,

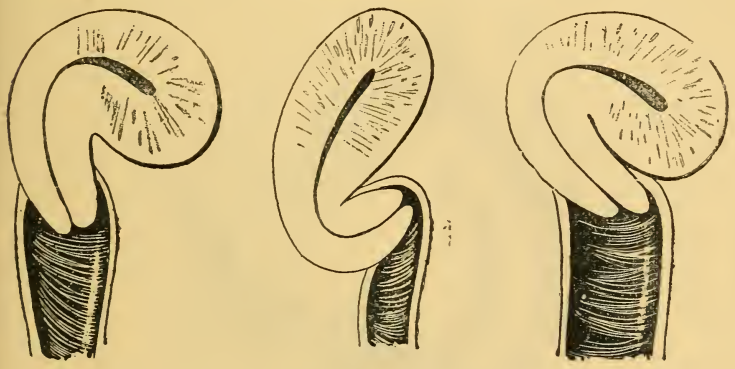

Fig 221.—Anteflexion of the uterus: varieties (G. Thomas).—A, corporeal.—B, cervical.—C, cervico-corporeal.

which is already well developed. It only requires the growth of the uterus to be irregular at the period of puberty, and the anterior wall to be slower in its development than the posterior one, for the anteflexion known as congenital to take place. We may, as a second proof of its arrested development, have this accompanied by a cervix still in the infantile state. This will be found comparatively long and conical (fig. 223), or even tapiroid, like the snout of a tapir, with a very narrow external orifice. Sometimes even the atrophy of the anterior lip will be very manifest, and will offer a sure indication of the atrophy of the corresponding wall. Lastly, this congenital anteflexion has been found to coincide with the hypoplasia of all the genital organs and narrowness of the pelvis.

Congenital anteflexion does not generally present such an

acute angle as acquired anteflexion. It is usually of one of the two first varieties described by G. Thomas (fig. 221).

Anteflexion may be acquired at the time of puberty when the mode of life of the young girl is unhealthy; when the uterus becomes swollen and softened under the influence of the first menses; excessive fatigue after riding; masturbation, and all the causes of metritis in a virgin may come into play to produce both inflammation and deviation of the uterus. It is easy to understand that a general softening of the organ will allow it to bend on the level of the isthmus like a hinge, and to lean over still more towards the side on which it was curved

Fig. 222.—Anteflexion of infantile origin. (The curve is at an acute angle; the body is globular.)

during infancy. The origin of the trouble has sometimes been put down to some effort or some fall.

Metritis of puerperal origin is to be counted amongst the causes of acquired anteflexion, although it must more often give rise to retroflexion. One may with E. Martin* be quite right in attributing it to the absence of sufficient involution of the posterior wall of the uterus after delivery or abortion. This may be brought about by fragments of membrane or placenta, setting up a local infection which is more intense just where

* E. Martin (senior). Die Neigungen und Beugungen des Uterus. Berlin, 1870, p. 141.

they are situated. Schultze,* following E. Martin, has given very great importance to posterior parametritis situated on a level with the utero-sacral ligaments and inducing their retraction (fig. 224). Schultze maintains that in this case the cervix is always situated higher up in the pelvic cavity, and that consequently the vagina becomes elongated. As to the origin of posterior parametritis, he puts it down most often to puerperal or gonorrhœal infection.

I believe that it is most often due to peri-salpingitis. The adhesions which it gives rise to, and which fix the cervix firmly backwards, cause the body to be thrown forwards, and bring about the flexion just on a level with the isthmus, which is

Fig. 223.—Very acute anteflexion with sub-vaginal hypertrophy of the cervix.

weakened by the accompanying metritis, whereas the cervix, which is hypertrophied and sclerosed owing to previous inflammation, remains rigid (fig. 225). The subvaginal elongation of the cervix, resulting from an inveterate catarrh, frequently exists with the anteflexion, as has been well shown by A. Martin. This author attributes very little importance to congenital lesions.†

* Schultze. Treatise on uterine deviations, translated by Herrgott. Paris, 1884, p. 210.—Martin, *loc. cit.*, p. 123.

† A. Martin. Clinical treatise on diseases of women, French translation, 1889, p. 93

Symptoms.—Anteflexion of a congenital origin brings about amenorrhœa or a delay in the appearance of the menses, when it occurs with arrested development in the internal genital organs. If the menses appear at the ordinary time, they are scanty and irregular.

At other times, the flow of blood remaining normal in amount, dysmenorrhœa is the symptom which makes its appearance. There are violent pains in the loins, whilst the blood distends the cavity of the uterus above the point of flexion; then a time comes when the obstruction is overcome, the blood is suddenly

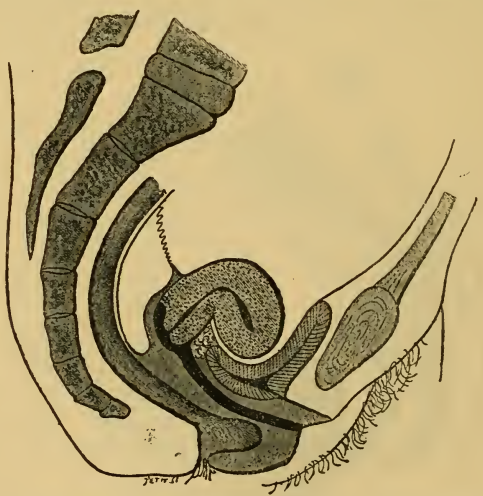

Fig. 224.—Anteflexion from shortening of the utero-sacral ligaments.

expelled in a stream more or less mixed with clots, and giving off a very strong smell, which has been attributed to its long period of stagnation.

The mechanical theory attributing the pains of uterine dysmenorrhœa to anteflexion is the one most generally accepted after J. Y. Simpson and Marion Sims. It is not accepted by Fritsch, who finds an explanation for the pains in the irritation of the nerves due to congestion and to the abnormal tension of the bent vessels on the level of the flexion. It is, however, difficult to help attaching very great importance to the obstruction, owing to the paroxysmal character of the crises and the flow of blood. One may even feel inclined to ask whether the

posterior perimetritis mentioned by Schultze is not sometimes the consequence rather than the cause of an anteflexion, bringing on every month the effusion of a few drops of blood into Douglas' pouch through the tubes, and so producing a sort of diminutive and periodical hæmatocele. This would afford an explanation for the acute and febrile phenomena which sometimes terminate the attacks of dysmenorrhœa.

The patients present all the symptoms which belong to the uterine syndroma. There is generally well-marked dysuria and the reflex nervous phenomena are very prominent.

There is frequently pain complained of during conjugal inter-

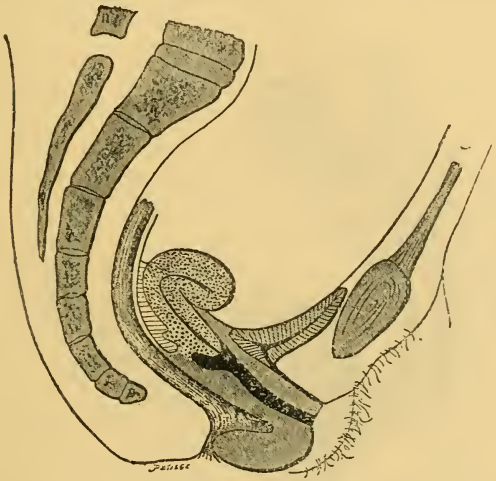

Fig. 225.—Anteflexion combined with retroposition. Adhesions in Douglas' pouch.

course or dysparunia (Barnes); sterility is the rule, and should conception take place abortion is to be feared.

Diagnosis.—If one is dealing with the most frequent type of acquired anteflexion, that is, corporeal anteflexion, the finger which depresses the anterior cul-de-sac of the vagina will feel the fundus of the uterus bent like the butt end of a pistol, and almost on the same level as the cervix. If the organ is depressed by bimanual palpation, the fundus will be put within reach of the index, which, by means of tactus, will recognise the angle of flexion. The cervix is in the axis (fig. 221, A).

In the variety of cervical anteflexion, the cervix is on the

contrary rendered oblique from above downwards and from before backwards, the orifice is looking directly forwards and upwards; if one merely performs a digital examination of the cervix one might think there was a retroversion; but bimanual palpation reveals the presence of the body in its normal place (fig. 221, B).

In the variety of cervico-corporeal anteflexion, the direction of the cervix is the same as the preceding, but the body is also curved forwards and is hidden behind the pubis; by depressing the anterior cul-de-sac of the vagina in front of the cervix, one is enabled to feel it (fig. 221, C).

Sometimes the uterus is so extremely curved upon itself that

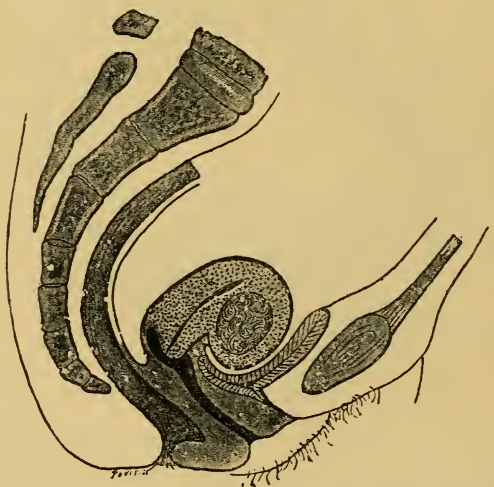

Fig. 226.—Anteflexion simulated by a fibroid tumour in the anterior wall of the uterus.

the angle of flexion cannot be reached with the finger, and a sort of globular mass is formed which may well be mistaken for a fibroid tumour or for inflammatory induration. The opposite error may also be fallen into (fig. 226). The catheter will then come in very usefully; its introduction will be greatly facilitated if the cervix is seized hold of with a pair of forceps and drawn a little backwards and downwards. The sound should be appropriately curved and directed with great gentleness in the presumed direction of the uterine cavity, whilst one finger is pressed on the anterior cul-de-sac to slightly raise the organ.

When the sound has penetrated, it is sufficient for getting the uterus properly raised to bring the handle forwards. One is then enabled by means of bimanual palpation, combined with the rectal touch, to explore very thoroughly the two surfaces of the womb to ascertain the presence or absence of any new growth, and to make out how far the organ is movable. In any case this exploration should only be resorted to if the recent appearance of the menses puts aside the question of pregnancy being present.

A vesical calculus, when pushing down the anterior vaginal cul-de-sac, might only be mistaken for an anteflexion when one neglected both to examine the uterus methodically and to pass a catheter into the bladder.

Treatment.—Acquired anteflexion is generally only productive of pain owing to the accompanying inflammation or to the pressure on the bladder and excessive mobility of the uterus; relief will be obtained from a belt or pessary without a previous reduction being necessary (see above: Anteversion).

But the treatment has more especially to deal with the co-existing metritis. In the simplest cases, the use of the curette followed by injections of an iodine solution may suffice. Most often it will also be necessary to have recourse either to biconical amputation, or to excision of the mucous membrane, according to Schröder's method. The progressive involution of the hypertrophied cervix will thus be much more rapidly brought about, and the result will greatly surpass that following immediately upon the use of the knife, and as the metritis gets cured those morbid symptoms which may have been put down to the deviation will disappear. This latter will sometimes right itself all alone little by little. It seems to me quite probable that some of the good results obtained by M. Sims with the sagittal discision of the cervix (fig. 227), which was so much in vogue, and of which he made such an abuse, should be ascribed to the indirect action of the operation upon the involution of the uterus affected with chronic metritis, much more than to the proper calibre of the cervix being restored.

Congenital anteflexion requires some intervention, either on account of the very painful dysmenorrhœa it produces, or to cure the sterility. Reposition and dilatation have had a great deal said in their favour. Should one decide to practise them,

it is as well to combine them and to let every attempt at reposition be preceded by the introduction of laminaria tents, after ascertaining exactly with the sound the extent to which the cervico-uterine canal is patulous, and its direction. The laminaria tents impregnated with iodoform, when sufficiently thin. are flexible enough for one to give them the suitable curve. It is useless to try and obtain too wide a dilatation. The principal object in using the tents is much rather to soften the tissues and to render them more flexible with a view to raising the parts later on. The latter part of this process has besides already been commenced by the dilatation itself. After having enlarged, dilated, and to a certain extent rectified the axis by the application of one or two dilating tents, one should continue to pass Hegar's bougies two or three times a week, by fixing the cervix with the forceps, and pushing back the body with

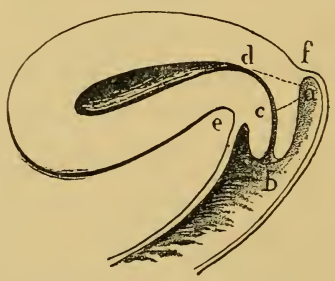

Fig. 227.—Sagittal discision of the cervix in cervical anteflexion (Sims).

a, *b*, *c*, portion of the neck to be divided with the scissors; *c*, *a*, *d*, triangular portion of the cervical tissue which escapes the action of the scissors, and which one divides with a metrotome or a probe-pointed bistoury; *e*, *f*, sub-vaginal portion of the cervix on the level of which the flexion occurred.

the finger pressing through the anterior cul-de-sac. One should stop after using the bougies No. 10 or 12.

As to the method of suddenly raising the uterus by means of the sound, which is twisted round by a regular trick and so brings the body momentarily forwards, this is not the place to speak of it.

Since the uterus to be dealt with in these cases is nearly always incompletely developed, the gradual dilatation and the constant passage of bougies brings on some congestion and sets up so much extra activity in the nutrition of the organ that one may reasonably count all this amongst the principal advantages.

Besides the pessaries which I have indicated in the preceding article, and which can all be applied indifferently to anteversion or to anteflexion, some special ones have been described for anteflexion. Fancourt-Barnes' pessary is a combination of those named after Hodge and Graily Hewitt. Thomas has invented a complicated instrument consisting of a Hodge's pessary supporting a cup to which is fixed an intra-uterine stem; I also wish to mention Gehrung's pessary. I much prefer the hypogastric belts to vaginal pessaries in cases of anteflexion as well as in cases of anteversion, and amongst these latter that of Dumontpallier is, I believe, quite sufficient.

The intra-uterine or stem pessaries* which were so much extolled by Simpson in England and by Valleix in France,† and which were the cause of so many mishaps when uterine

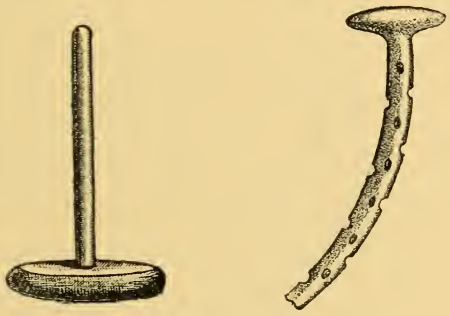

Fig. 228.—Stem pessaries.
A, stem pessary.—B, Fehling's intra-uterine stem pessary.

surgery was not antiseptic, should only be employed in exceptional cases.‡ But, should one have to deal with a very faint-hearted and nervous young woman, for whom the oft-repeated manipulations required by progressive dilatation are a real torment, or again, should these manipulations be each time accompanied by real difficulty, one would be justified in introducing and leaving an instrument for dilating and holding up

* Winckel. Die Behandlung der Flexionen des Uterus mit intra-uterinen Elevationen, 1872.

See on this point of historical interest, Rochard. History of French Surgery in the 19th century, 1875, p. 834.

‡ This method of treatment still finds enthusiastic advocates. G. Thomas, New York Med. Journ., Dec., 1888, vol. 48, p. 729.

the uterus. The old stem pessaries used to be quite straight, which was a mistake, since the uterus in its normal state is curved forwards. They were most often composed of two metals, copper and zinc, whose galvanic action was supposed to add a beneficial influence to the dilatation. Fehling has had a much more rational instrument constructed; this is a tube made of thick glass, which is fenestrated, provided with an open extremity and slightly curved; the curve can besides be increased by placing it over a spirit lamp. It is filled with iodoform powder, which is kept in place by a plug of cotton-wool, and is then introduced into the uterus, care being taken that it should be about half a centimetre shorter than the cavity of the organ, which should have been previously measured. The patient is kept in bed under observation for eight days, after which she may be allowed to get up, and, according to the author,* the stem pessary may be removed after eight, ten, or twelve months. The instrument is retained by the mucous membrane-forming small projections into the holes with which it is perforated; it is, besides, very light and has no tendency to fall out (fig. 228, B). I consider the delay of eight months too long, for the good effect ought to be produced at the end of one or two months at the longest.

Fig. 229.
Metrotome (Collin).

To allay the violent pains of dysmenorrhœa one should use morphia and belladonna suppositories.† If necessary two or three of them should be introduced into the rectum in the course of twenty-four hours. Good results will be obtained from massage.‡

* H. Fritsch. Die Krankh. der Frauen, 3rd edit., 1886, p. 244.

† The following is the formula:—

℞. Cacao butter ... ... 2 grammes.
Chlorhydrate of morphia ... ... { āā, 0·01
Extract of belladonna ... ... { f. s. a.

‡ Vierow. Zur mechanischen Behandlung der Dysmenorrhée bei anteflexio Uteri nach Thure-Brandt. (Centr. f. Gyn., 1890, No. 52, p. 930.)

Lastly, should one become convinced that the dysmenorrhœa is of ovarian and not uterine origin, so that the anteflexion is merely taking an apparent part, one should not lose any time over this secondary phenomenon, and should the gravity of the symptoms warrant such a decision, one should resort to castration* or Battey's operation (see the chapter on Dysmenorrhœa).

In congenital anteflexions the cervix is often conical and the orifice in a state of stenosis; this is the principal cause of the pains. For these cases the practice has for a long while been to make a bilateral incision with the scalpel, J. Simpson's metrotome, Collin's metrotome (fig. 229), or Küchenmeister's scissors. The results obtained in this manner are not lasting, for the cicatrisation re-establishes the former state of things. It is much better to do a real stomato-plastic operation by amputating the cervix with biconical flaps.†

Cervical anteflexion presents some special indications; it is mostly to combat the sterility that the operation of discision is performed. Marion Sims (fig. 227) used to incise the posterior lip by means of his knife with a short and curved blade; Emmet makes a similar incision with a pair of elbow-scissors, which is preferable; he finishes getting the canal straight by using a curved tenotomy knife to incise a certain thickness of tissue on the anterior surface so as to form a sort of spur. The incision is kept open by a glass tube. A triangular piece has also been removed from the posterior lip, or even the whole of this lip. More complicated plastic operations have been proposed (Küstner, Dudley‡); I disapprove of them all equally. If there is any deformity whatever of the cervix, the best is to amputate it (according to the rules which I have given in the chapter on Metritis), taking particular care about the renewed formation of an ample opening.

* H. Fritsch. Die Lageveränderungen der Gebärmutter, &c. (Deutsche Chir., Stuttgart, 1885, p. 69.)

† A. Martin. Path. u. Ther. des Frauenkrankh., p. 85.

‡ Dudley. A plastic operation to straighten the anteflexed uterus. (Amer. Journ. of Obstet., 1891, vol. 24, p. 145.)

CHAPTER II.

BACKWARD DEVIATIONS.

The backward deviations are by far the most frequent, and they play a rather large part in uterine pathology. Sänger* counted 108 cases of retroversion in 700 cases of diseases of women, that is, 15·43 per cent. Winckel found 19·10 and Löhlein 17 to 18 per cent.†

I.—Retroversion.

Morbid Anatomy. Etiology.—Symptoms.—Diagnosis.—Treatment.

Morbid anatomy. Etiology.—Whenever the bladder becomes full, the womb undergoes temporary physiological retroversion; the tonicity of the broad ligaments, of the round ligaments, and the utero-sacral ligaments, which, one should remember, contain a large quantity of smooth muscular tissue, generally brings the organ back to its normal situation. But should its weight be increased by some inflammation and especially by any delay in post-puerperal involution, and should the ligaments themselves have undergone any relaxation whilst the womb is in a state of turgescence owing to metritis, it may happen that the retroversion becomes permanent under the influence of the prolonged horizontal decubitus.

The organ becomes fixed in its new position by adhesions. This posterior pelvic peritonitis, which has its origin in the situation of the extremities of the inflamed tubes, is sometimes even the prime factor.

A sudden effort or a fall is at other times the determinative cause of the deviation‡; one may afterwards find the vagina prolapsed or slightly descended.

* Sänger. Soc. obstet. de Leipzig, Nov. 17, 1884 (Centr. f. Gyn., 1885, p. 664).

† Löhlein. Zeitschr. f. Geb. u. Gyn., 1882, Bd. 8, p. 102.—Mundé. Amer. Journ. of Obstet., Oct., 1881, p. 789.

‡ P. Tillaux. Accidental and instantaneous retroflexion of the uterus; immediate cure by reposition (Annal. de gyn., Dec., 1889, vol. 32, p. 405).

Retroversion is rarer than retroflexion.

Symptoms.—When the displacement occurs all at once after some effort, it is accompanied by a sudden pain and by various nervous phenomena, just as would happen with a sudden prolapse of the womb taking place under the same conditions.

When the deviation takes place gradually the symptoms are generally associated with those of the metritis or circumscribed parametritis which have given rise to it; one observes the uterine syndroma. Sterility is the rule. As for vesical and rectal tenesmus, which are sometimes well marked, they may be absent.

Palpation, aided by tactus, will enable one to recognise the

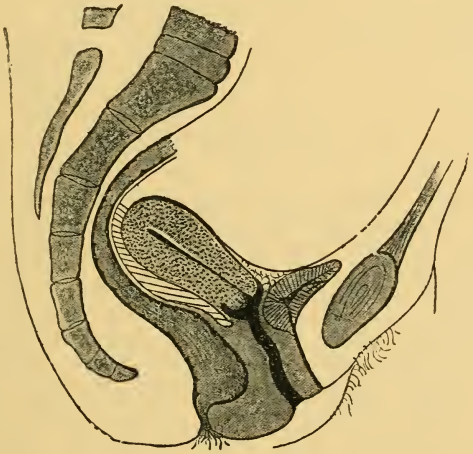

Fig. 230.—Retroversion with extensive adhesions on the posterior wall.

cervix in its forward position and the body which is directed backwards towards the concavity of the sacrum, where it is more or less fixed. The two segments of the uterus remain directly continuous with one another.

Diagnosis.—Bimanual palpation with the help of the rectal tactus, and, if needs be, the use of the catheter, are the means by which one may recognise exactly the situation of the organ when the neck is directed forwards whilst the fundus is to be felt through the posterior cul-de-sac. What distinguishes this deviation from retroflexion is the absence of any angle or elbow between the body and the neck. It should not be mistaken for

a fibroma of the posterior wall of the uterus, a retro-uterine hematocele, a tumour of the ovary or the tube, which may have become prolapsed into Douglas' pouch, a centre of inflammation produced by parametritis posterior, an accumulation of scybalous masses. Nearly all the doubts which might be given rise to by these various hypotheses would be easily relieved by resorting to uterine catheterisation combined with other methods of exploration ; this would be especially useful for distinguishing it from cervico-corporeal anteflexion, which is the source of almost unavoidable errors, if one confines oneself to the simple digital examination of the cervix, owing to the antero-posterior position of this latter.

Treatment.—It is intimately mixed up with that of retroflexion. (See below.)

II.—Retroflexion.

Morbid Anatomy. Etiology.—Symptoms.—Diagnosis.—Treatment of the metritis ; curetting, amputation of the cervix. Reduction by means of position. Bimanual reduction. Reduction with the sound. Fixation of the reduced uterus. Pessaries.—The Alquié-Alexander-Adams operation. The technics of the operation. Gravity. Results. Ulterior pregnancy. Indications. Vaginal hysteropexy. Methods of procedure adopted by Amussat, Richelot, senr., Bossi, Sims, Byford, Doléris, Skutsch, Schückling, v. Rabenau, Sänger, Nicoletis, Pean, Candela, Freund.—Abdominal hysteropexy. Historical notice. Technics of the operation. Procedure of Koeberle and Koltz, of Oldenshausen and Sänger, of Kelly, Leopold, Czerny, Terrier, and Pozzi. Procedure of Caneva ; gastro-hysteropexy without laparotomy. Prognosis of gastro-hysteropexy. Pregnancy and hysteropexy. Indications. Intra-abdominal shortening of the uterine ligaments. *a.* Shortening of the utero-sacral ligaments ; Kelly's procedure.—*b.* Shortening of the round ligaments ; procedure of Ruggi, G. Wylie, Bode, Polk, and Dudley.—Vaginal hysterectomy.—Choice of an operation.

Morbid anatomy. Etiology. — Unlike anteflexion, flexion directed backwards rarely dates from infancy or puberty. One may, however, find it coming on after metritis in a virgin ; its development is favoured by habitual constipation and masturbation (Fritsch). In an immense majority of cases retroflexion succeeds to metritis of puerperal origin ; absence of involution of the anterior wall of the uterus, caused by the retention of fragments of the placenta, would here, according to E. Martin, play a part similar to the one I have described in connection with anteflexion. Considerable influence should also be

attributed to the weight of the inflamed organ, to the relaxation of the broad ligaments and the round ligaments, which cease to direct the organ forwards; whilst the cervix remains fixed by the more resisting utero-sacral ligaments, the flaccidity of these ligaments allows the body of the uterus to become bent back on the level of the isthmus in obedience to the laws of weight and under the pressure of the mass of intestines. One may besides see retroflexion coming on after simple retroversion or even

Fig. 231.—Retroflexion of the uterus following upon sub-involution of the anterior wall, on which the insertion of the placenta is still to be observed. (E. Martin senior.)

anteversion; all that is required in the latter case is that the angle of flexion should remain flexible, just like a hinge.

The cervix is directed downwards and forwards; it is generally rather close to the vulva, because there is frequently a certain amount of depression. The orifice of the cervix is gaping, the lips are tumefied, owing to the obstruction to the venous circulation produced by the bending of the vessels; one should not

forget, besides, that one nearly always has to deal with women affected at the same time with metritis of puerperal origin. The body of the organ occupies Douglas' pouch.

A well-marked thinning of one or the other of these walls has been found, either in front (Ruge) or behind (Fritsch).

One has often an opportunity of observing adhesions, either perimetritic, due to exudation into Douglas' pouch, or parametritic, occurring under the serous membrane on a level with the utero-sacral ligaments. Schultze * has maintained that an important part is played by the relaxation and the loss of tone of these ligaments (or folds of Douglas) under the influence of the post-puerperal posterior parametritis, in the production of

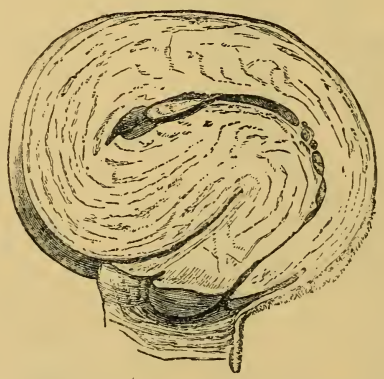

Fig. 232.—Extreme retroflextion of the uterus.

all uterine displacements. To have a clear idea, therefore, of the way in which retroflexion is produced, one should picture to oneself these ligaments preserving all their power of resistance during the first phase of acute inflammation, so as to maintain the cervix fixed ; it is only later on, during the period when the exudation is disappearing, that the interference with the nutrition of the ligaments would produce their flaccidity. According to whether the isthmus has resisted or given way during the first phase, one will have to deal with retroversion or retroflexion. In other words, version is suggestive of an alteration in the ligaments ; flexion of an alteration both in the ligaments and the uterine parenchyma at the same time.

The peritoneal adhesions uniting the fundus of the organ to

* Schultze. *Loc. cit.*, p. 259.

the recto-uterine cul-de-sac are most often loose and filamentous, and are easily torn. At other times they present great resistance, whether they are composed of cords or bands.

The ovaries and tubes are often drawn to the sides of Douglas' pouch, owing to the deviation of the uterus. It is probable that at least a part of the reflex nervous phenomena, often of a serious character, going even to the extent of paraplegia, which have been observed in certain cases of retroflexion, may be due to the appendages being dragged upon, and not to the possible compression of the nerves of the sacral plexus.

Salpingitis very often comes on at the same time; it is even the rule in irreducible retroflexions, and sometimes this irre-

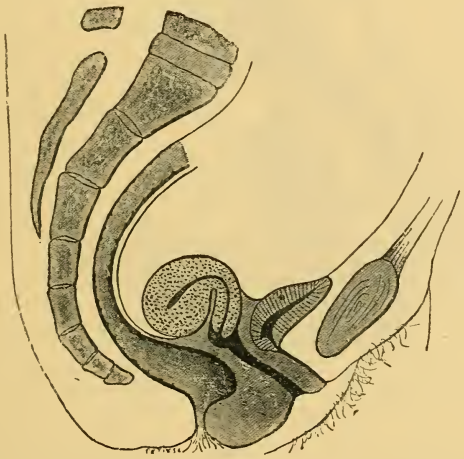

Fig. 233.—Retroflexion of the uterus in a nullipara. (The body is movable; the os tincæ has retained its normal situation.)

ducibility is due much less to the adhesion of the body of the uterus than to the appendages being fixed to the walls of the pelvis. Certain patches of peri-salpingitis give rise to these adhesions, as well as to some painful and indolent indurated nodules, which appear and disappear rapidly, and are frequently observed at the back and the sides of the retroflexed body.*

Symptoms.—Uterine syndroma (described with metritis), very well marked reflex nervous phenomena, sterility. Such are,

* U. Trélat. On retroversion and adherent retroflexions (Semaine méd., July 4, 1888, p. 261).

shortly, the rational symptoms. The constipation, with or without tenesmus, is especially obstinate, and Barnes looks upon the copræmia which results as the cause of the patient's falling into such a state of decline, although the cause is really of a much more complex nature.

It is as well to lay particular stress upon the nervous troubles to which I have alluded. They mostly take the form of extreme difficulty in walking, out of all proportion with what would be produced by mere muscular fatigue, and capable even of simulating paraplegia. One meets with neuralgia which is multiple

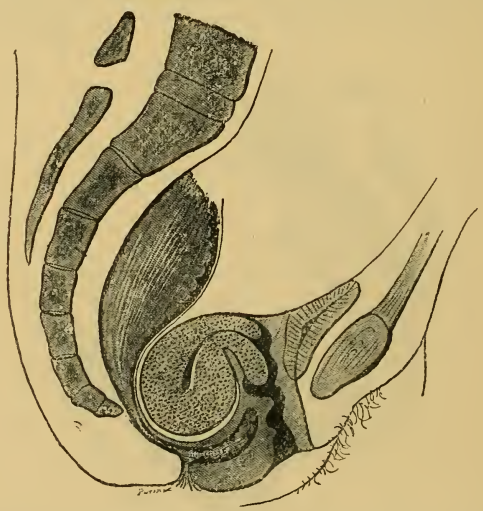

Fig. 234.—Very acute retroflexion of the uterus. Compression of the rectum, which has its lumen closed. Hypertrophy of the body of the uterus. Atrophy at the angle of flexion. Thickening of the posterior lip of the cervix; the anterior lip, which is thinned, is hidden in the cul-de-sac.

in character, an excitability taking the form of hysteria, a nervous cough, dyspepsia, &c. Chrobak * has observed a very intense form of asthma; Schröder has found chorea; † Kehrer,‡ aphonia; Sieiski, § hystero-epilepsy; Kiderlen, ‖ incessant vomiting; the simple fact of raising the uterus back into its

* Chrobak. Wien. med. Presse, 1869, No. 1, p. 8, and No. 2, p. 41.

† Schröder. Berlin klin. Woch., 1879, No. 1, p. 1.

‡ Kehrer. Beiträge zur klin. u. exper. Geb. u. Gyn., Giessen, 1887, Bd. 2, heft 3.

§ Sieiski. Centr. f. Gyn., 1888, p. 695.

‖ Kiderlen. Soc. obst. et. gyn. de Hambourg, April 2, 1889 (Centr. f. Gyn., 1890, p 81.

erect position has caused these grave symptoms to rapidly disappear.

Sterility generally follows when there is retroflexion. Fecundation may, however, take place, and then the uterus either rises or remains flexed, and becomes more and more wedged into the lesser pelvis, giving rise to serious symptoms, which are studied in obstetrics under the name of retroflexion of the gravid uterus.* If one then takes care to see that the uterus undergoes involution after delivery under favourable conditions, one may sometimes obtain the spontaneous reposition of the organ of gestation; pregnancy then plays a truly im-

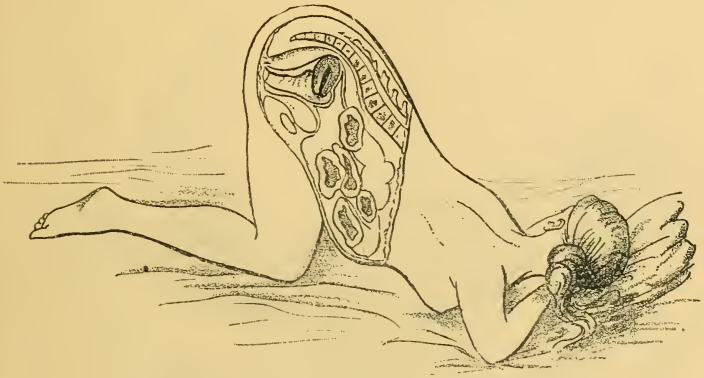

Fig. 235.—Reduction of a retroversion of the uterus by the genu-pectoral position.

portant part in therapeutics, but one which has, however, been exaggerated.

Diagnosis.—The situation of the tumour in the posterior cul-de-sac, easily recognised as the fundus of the uterus by means of bimanual palpation, the absence of any resistance in the anterior cul-de-sac at the level of the normal situation of the organ, the possibility of feeling the angle where the neck and the body unite; such are the distinctive characters which will be looked for clinically. The rectal touch is indispensable here. An exploration with the sound will remove any lingering doubt. It

* Certain authors make a distinction also for post-puerperal retroflexion, or that which comes on immediately after delivery. It is often merely one of the symptoms of post-puerperal metritis with delayed involution, and disappears like it after appropriate treatment. It is specially in these cases that Emmet's operation or the amputation of the cervix with or without special sutures (Nicoletis) has been followed by such remarkable results.

should have a proper curve given to it, and one should bring down, or at least fix the neck of the uterus with a pair of forceps. For more details I refer the reader to what has already been said about the diagnosis of retroversion.

It is important to clearly define the amount of mobility of the uterus, so as to determine the nature of the treatment. Professor Trélat, in dealing with this point, divides retroflexions into three classes: 1. Reducible; 2. Resisting; 3. Adhesive. One

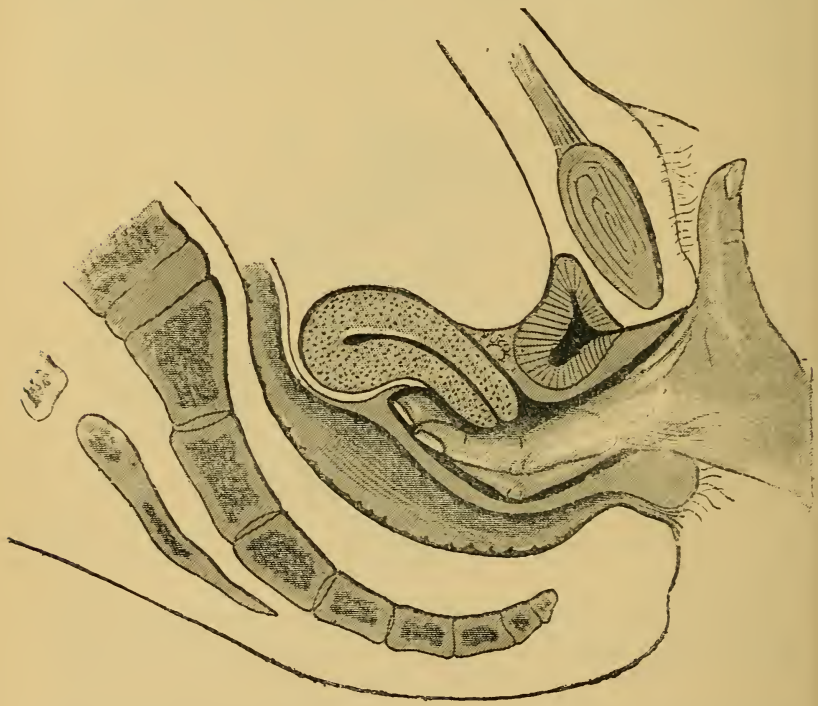

Fig. 236.—Bimanual reduction of a retroversion or retroflexion. 1st stage: raising the uterus.

can get an idea of these various degrees by trying to produce reduction either by bimanual manipulation, or with the sound, by judging of the amount of resistance encountered, and the degree of permanency of the reduction.

Treatment.—Ought one to begin by treating the accompanying metritis, or to first of all correct the deviation? This question has been resolved by authors in various ways. I believe that

there is everything to be gained by curing the inflammation of the uterus first of all, and for this to have recourse to the action of the curette, followed by injections, and, for catarrhal and chronic painful metritis, to amputate the cervix. One frequently sees cases of retroflexion which cease to be painful after the metro-salpingitis has been cured, and even afterwards the

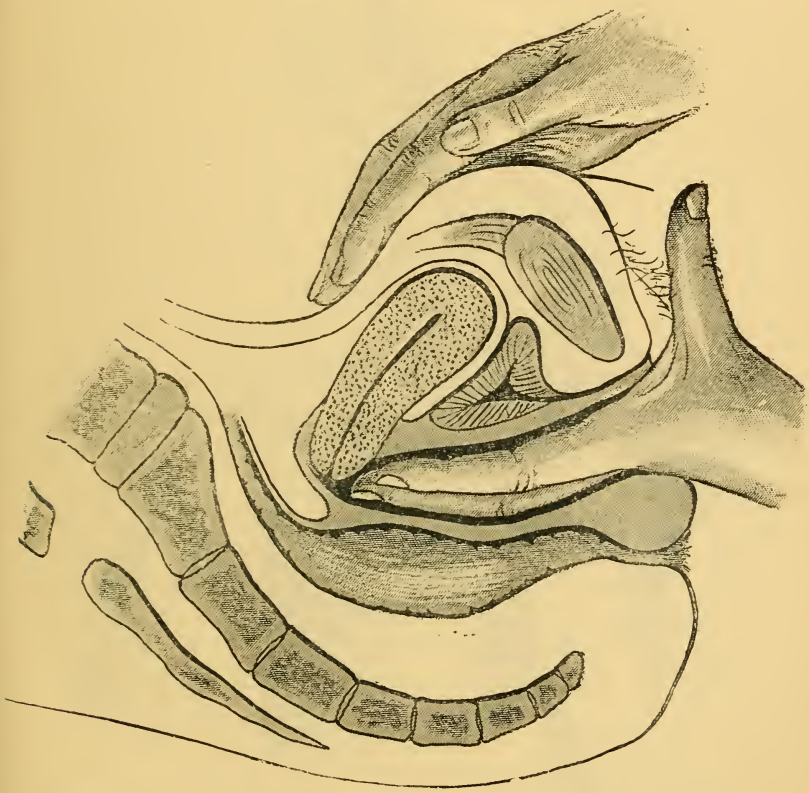

Fig. 237.—Bimanual reduction of a retroversion or retroflexion. 2nd stage: the reduced uterus placed into a state of anteversion.

involution of the uterus may undergo a certain amount of spontaneous reduction. It is as well in special cases to invariably have recourse, before curetting, to a preliminary dilatation with a laminaria tent, by which, for the time being, the uterine canal begins to be raised up.

Should the metritis be coincident with acute peri-metro-

salpingitis, one should endeavour to get rid of it by means of an appropriate treatment (hot injections, baths, the application of glycerine tampons to the cervix, of counter-irritants to the abdomen). It is only when every sign of inflammation has disappeared, and that no pain is produced on examining the

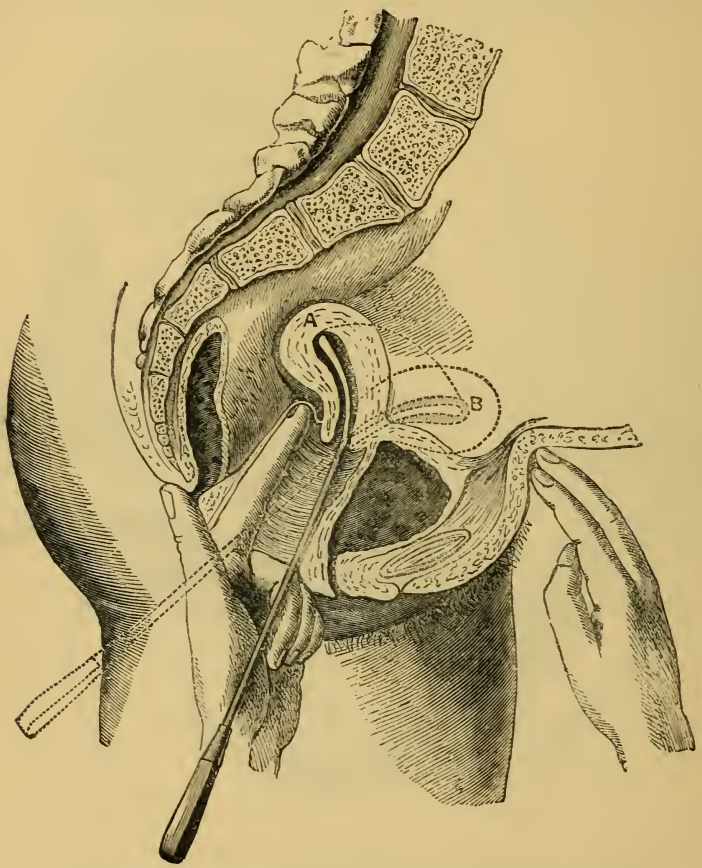

Fig. 238.—Retroflexion of the uterus reduced by means of the sound.

culs-de-sac, that one should set about raising the uterus, and then maintaining it after reduction. The contrary practice, recommended by Poullet,* seems to me most imprudent.

* Poullet. On intra-uterine intervention, &c., read before the Soc. de Méd. de Lyon, Feb. 6, 1888.—Rowland. On the treatment of adhesive retroversions and retroflexions of the uterus. Thesis for M.D., Lyons, 1888.

Reduction of the retroflexion.—Reduction of the deviation of the uterus may be induced in various ways.

1st. *Reduction by the genu-pectoral position.**—When the woman is put into the genu-pectoral position, the legs being slightly separated and the fourchette being depressed, so as to allow the entrance of air into the vagina (fig. 235), the abdominal viscera fall towards the concavity of the diaphragm, and the retroverted or retroflexed uterus, if movable, goes back to its normal position. This reduction may also be helped if the vaginal walls are kept separated, and if the fourchette is kept depressed with a valve, so as to exert traction upon the posterior cul-de-sac. This aerial spontaneous reposition, as Courty calls it, constitutes a valuable exercise which any woman can easily perform each day by assuming morning and evening, for a few minutes, the attitude of the Mahometans when at prayer (Tarnier †).

Farnier recommends women, on assuming this position, to introduce a small wire-work speculum, or simply an injection-canula, into the vagina, so as to facilitate the access of air and the falling back of the uterus. Elisa Mosher,‡ who has again quite recently insisted upon the treatment by this position, recommends the patients to introduce the finger into the vagina and to press upon the anterior surface of the cervix, so as to tilt the uterus forwards. Although this manœuvre is rarely sufficient by itself, it is undoubtedly a valuable adjunct for the treatment of those deviations which are of recent date. One should also recommend the patients to accustom themselves to lying on their belly, or in semi-pronation.

2nd. *Bimanual reduction.*—The patient has to be placed in Sims' lateral position, or, if needs be, in the genu-pectoral position. Two or three fingers of the left hand are passed into the posterior cul-de-sac or into the rectum, and the cervix is pushed backwards, whilst the right hand presses down the

* The advantages of this position seem to have been first brought prominently forward in America by H. F. Campbell (of Augusta, Georgia). Pneumatic self-replacement of uterus (Trans. of the Amer. Gyn. Soc., Boston, 1877, vol. 1, p. 193); in Germany, by Solger, Beiträge zur Geb. u. Gyn. der Ges. f. Geb. zu Berlin, 1873; in France by Courty, Transactions of the French Association for the advancement of science, Paris, 1881.

† Tarnier. Preface to the French translation by Bar, of Hegar and Kaltenbach's Treatise on gynæcological operations, Paris, 1885.

‡ Elisa Mosher. Amer. Journ. of Obstet., Oct., 1887, p. 1028.

abdominal walls above the pubis, seizes the fundus and brings it forwards into a state of anteversion. The new position has, in fact, to be exaggerated so as to effectually combat the tendency the organ has to become retroflexed. This manœuvre will be greatly facilitated if the cervix is fixed with a pair of forceps and drawn gently downwards.*

In difficult cases, Schultze † has recommended the introduction of the index finger into the cavity of the uterus after dilatation; owing to the action it thus exerts directly upon the substance of the uterus, the posterior adhesions which prevent reduction, are violently rent asunder. He gives a minute description of the way the uterus should be freed from the pseudo-ligaments or cord-like adhesions, which fix it backwards and sideways, or the superficial adhesions fixing it to the anterior wall of the rectum. With the help of an anæsthetic one can also feel the ovaries, and he maintains that one can succeed in destroying their adhesions. This vigorous method has found imitators, but has also met with a good deal of opposition (Schröder). There is no doubt that Schultze has obtained remarkable success by it; but if there is any inflammation of the tubes it may be the cause of a formidable disturbance, and seems to me to be then a truly dangerous proceeding.

3rd. *Reduction with the sound.*—This is the method which is in most general use, and Schultze himself recommends it in cases where the resistance to be overcome in the adhesions is not out of the way.

The operation is also performed in Sims' lateral position or the genu-pectoral one. The sound to be chosen should be fairly big and resisting, and has, first of all, to be introduced several times running, so as to reduce as far as possible the retroflexion and to transform it for the time being into retroversion. Then, by making the sound describe a large curve, one will force its extremity to undergo, inside the uterine cavity, a rotatory movement which will bring its concavity forwards. The uterus is

* Otto Küstner. Centr. f. Gyn., 1882, No. 28, p. 433.

† Schultze. Eine neue Methode der Reposition hartnäckiger Retroflexionen des Uterus (Centr. f. Gyn., 1879, No. 3, p. 49).—Ueber Diagnose und Lösung peritonealer Adhäsionen (Zeitschr. f. Geb. u. Gyn., 1887, Bd. 14, hett 1, p. 23).—Zur Therapie hartnäckiger Retroflexion der Gebärmutter (Samml. klin. Vorträge, N.F., 1891, No. 24, p. 187).—Erich. Eleven cases of retroflexion of the uterus, &c., treated by forcible separation of adhesions. (Amer. Journ. of Obstet., Oct., 1880, vol. 13, p. 836.)

then lifted up, but is in a state of retroposition; to bring it forwards one should carry the handle of the sound down towards the fourchette (fig. 238).

While these manœuvres are going on, no sudden effort should be made, but gentle and continuous pressure should be exerted, which may be very firm so long as it takes place progressively.

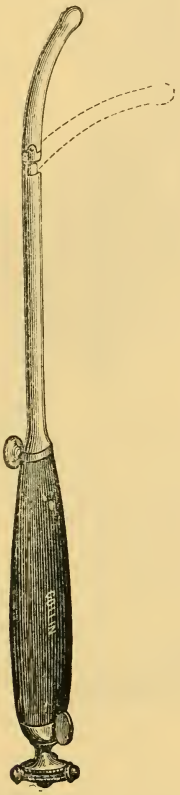

Fig. 239.—U. Trélat's uterine repositor (*redresseur*).

It is as well that the performance of retroposition should be preceded by that of dilatation with a laminaria tent, so that the tissues gain in suppleness; one of the first things to be done is also to apply the curette to the uterus, the mucous lining of which is in a more or less unhealthy condition, especially on a level with the angle of flexion. The reduction may be brought to an end at one sitting. At other times there may be good

reason for having several sittings, at intervals of two or three days; after each one of them the uterus will be maintained in that state of reposition which it has reached, by carefully placing

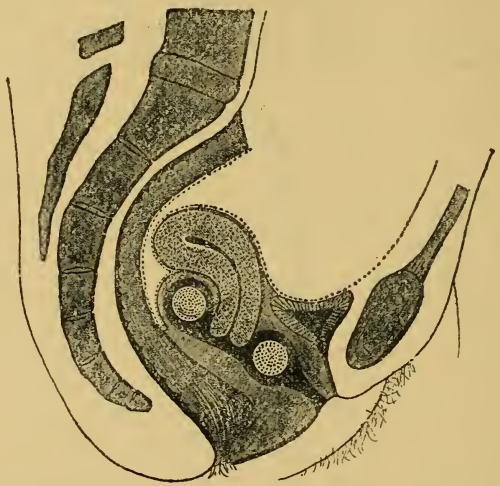

Fig. 240.—Dumontpallier's ring pessary *in situ*, in a case of reducible retroflexion which it is in the act of transforming into one of retroversion; (the reduction of the latter may sometimes take place later on spontaneously).

some tampons of antiseptic gauze in the posterior cul-de-sac. Lastly, a pessary is introduced.

The most simple instrument to be used in reduction is the hysterometer. I prefer it to the various repositors which have

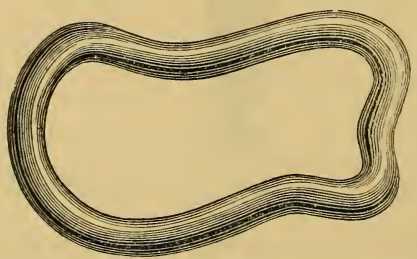

Fig. 241.—Hodge's pessary with an anterior notch to avoid compressing the urethra.

been invented, the best known of which is that of Sims, and one of the most recent that of J. A. Miller (of San Francisco).* Professor Trélat has also had a very ingenious repositor

* J. Alex. Miller. Amer. Journ. of Obstet., 1887, vol. 20, p. 146.

(*redresseur*) constructed, consisting of an uterine sound with a joint, the bend of which can be increased after introduction into the uterus (fig. 239).

Fixation of the reduced uterus.—One may for this resort to prosthetic means (pessaries), or perform various operations.

Pessaries.—The number of pessaries employed for maintaining retroflexions is considerable, and increases daily. For the

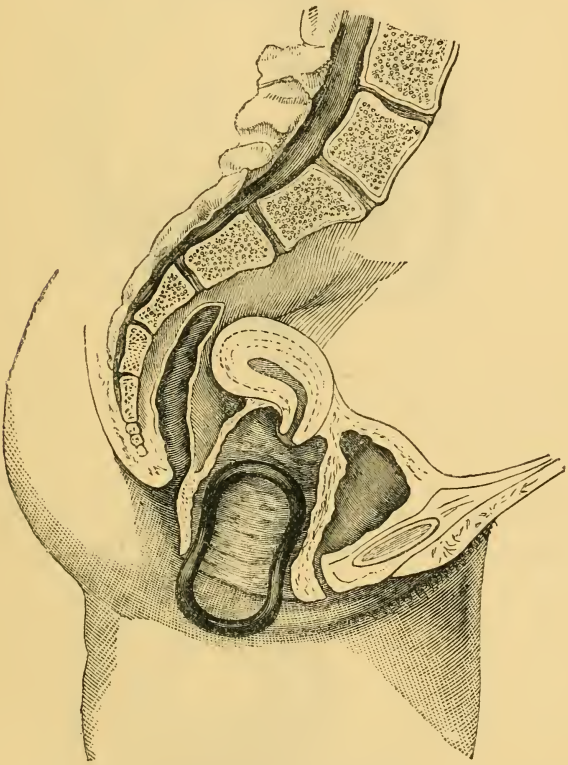

Fig. 242.—One of Hodge's pessaries being introduced in a case of retroflexion (this should have been previously reduced).

description of the various models I must refer the reader to the special articles on the subject,* and I shall limit myself to describing the most common, which are at the same time the best.

* A. Auvard. Art. Pessary in the Encycl. Dict. of medical science. 2nd s., vol. 23, p. 614.

A simple tampon, properly placed and renewed, in the posterior vaginal cul-de-sac is one means we have at our disposal. But it is much better to apply an indifferent pessary, such as

Fig. 243.—Hodge's pessary *in situ*, after reduction of a retroflexion.

Dumontpallier's ring pessary, which has sometimes, in cases of reducible retroflexion, even in the absence of surgical interference, been capable of raising the uterus by the pressure it exerts (fig.

Fig. 244.—Gaillard-Thomas' pessary.

240). Lastly, a still better means is Hodge's pessary with a double curve (figs. 241, 242, and 243).

In each case the pessary requires to be chosen to suit the

dimensions of the vagina; if it is too small it is of no use; if too big it becomes unbearable. If the perineum is resistant the

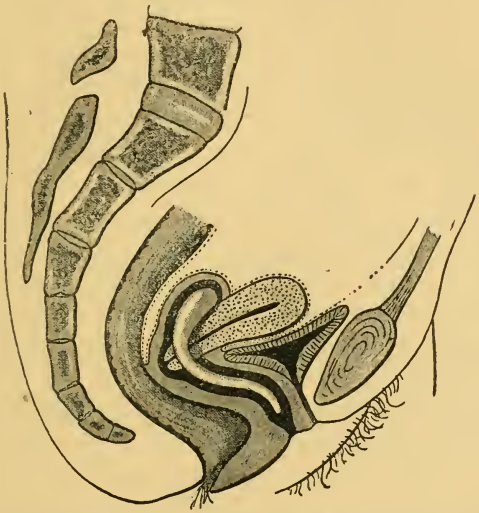

Fig. 245.—G. Thomas' pessary in position, after the retrodeviation has been reduced.

Fig. 246.—Cradle pessary in position, after a retrodeviation has been reduced.

pessary may be a little narrowed inferiorly (Albert Smith's pessary); this would be inconvenient in the opposite case. It

is as well for it to have a small notch in its anterior part, to avoid compressing the urethra (fig. 241). The most convenient pessaries are those made of a thick piece of copper wire covered with caoutchouc; their shape can be modified at once, although they offer a fair amount of resistance; one ought in fact to know how to adapt the instrument to each individual case by increasing the curves more or less as required. The hard caoutchouc pessaries are also very good, do not undergo any change, and one can soften them in hot water so as to alter their shape. In difficult cases I am in the habit of shaping a pessary with a ring made of flexible pewter, and when I am satisfied that it is exactly adapted to the special case I have a pessary made after this model out of aluminium, which has the advantage of being both light and resistant, but the vaginal secretions affect it, and it requires to be frequently changed.

It is always necessary for the lower extremity to remain a little above the urinary meatus.

G. Thomas has had the thickness of the posterior arch of Hodge's pessary increased so as to prevent it from getting fixed in the renewed angle of retroflexion, and has also had its curve accentuated (figs. 244 and 245).

To introduce one of Hodge's pessaries the patient has to be laid on her side. The instrument, smeared with vaseline, is pushed towards the vulva, so that it first of all passes flatwise along the lateral wall of the vagina; in the meantime the labia are separated and the finger catches hold of the fourchette so as to depress it. As soon as the pessary has got beyond the lower portion of the vagina (fig. 242), and can be easily turned in the more roomy upper portion, it is made to undergo a sliding movement upwards and backwards, following the line of a half spiral, which will bring it against the posterior wall. There is nothing more to do than to press the index finger against the upper curve to make it glide into the posterior cul-de-sac. The pessary thus becomes placed obliquely in the vagina, from above downwards and from behind forwards. The abdominal pressure, acting upon the pelvic floor in a constant manner and becoming exaggerated during any effort, has a tendency to push the pessary back and make it assume a horizontal plane. It then oscillates on the level of an imaginary axis which would pass through the middle of its

transverse diameter, so that its inferior extremity rises whilst its superior one descends, and consequently presses upon the posterior wall of the vagina, which is directed forwards. So

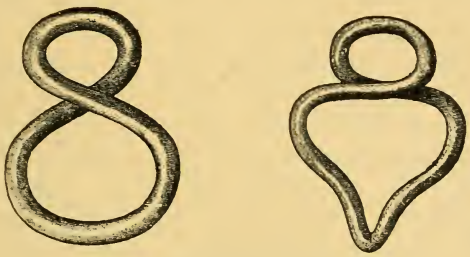

Fig. 247.—Schultze's figure of eight pessary.

that the stronger the intra-abdominal pressure is, the more the posterior cul-de-sac becomes stretched, and the more the cervix uteri becomes drawn backwards. The whole body of

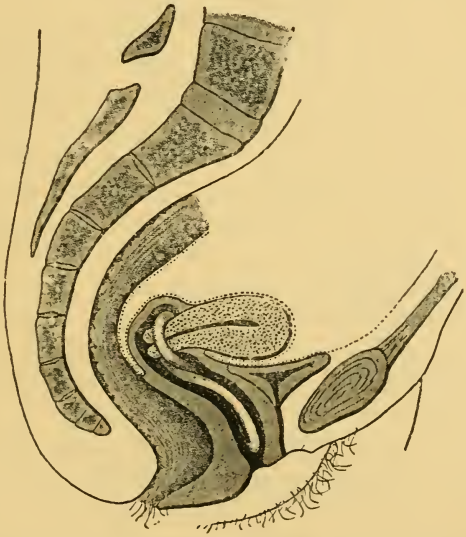

Fig. 248.—Schultze's figure of eight pessary *in situ*, after the reduction of a retro-deviation.

the uterus is carried forwards as a mass at once if the retro-flexion has been previously reduced. It is, besides, just as well to remark that even when this reduction is incomplete

some good has been obtained from a Hodge's pessary, and even from a simple ring pessary; no doubt their only action then consists in diminishing the mobility of the uterus.

The cradle pessary, or the one with a simple curve (fig. 246), has one advantage in not descending so low as Hodge's pessary, and in keeping up the anterior wall of the vagina at the same time; it is therefore specially useful in cases where there is some relaxation of that wall. But it has not such a powerful action as Hodge's lever pessary with a double curve.*

So long as the patient continues to use vaginal injections twice a day she can keep the pessary in for two or three months, after which it may be removed so as to ascertain the position of the uterus. If it remains anteverted the pessary may be given up, otherwise it should be replaced. The mishaps which have been mentioned as occurring after pessaries have been allowed to remain for too long a time are due to the instruments having been completely forgotten for years in the vagina with no regard whatever to cleanliness.

The above mentioned pessaries act indirectly upon the cervix by the tension they exert upon the neighbouring part. Another kind of pessary consists in those which have a direct action upon the organ. Schultze makes use of figure of eight pessaries, which seize the cervix itself and push it backwards; they are made of a piece of copper wire surrounded by a coating of caoutchouc (fig. 247). The pessary should be chosen so that the upper ring of the 8 surrounds the cervix without compressing it, whilst the lower ring is shaped to fit the vagina and the ischio-pubic arch. These pessaries are better borne by nulliparæ, in whom the vagina presents sufficient resistance for one not to have to look for any support outside on the bony framework; in the latter case they may become unbearable.

With the figure of eight pessaries one should mention Landowski's ingenious pessary (fig. 249), made of flexible pewter metal, allowing the T-shaped stem to be bent in any direction, according to whether the pessary has to be applied to an anteversion or a retroversion.

In the latter case, the stem is bent from behind forwards, and the anterior wall of the vagina is in contact with its concave surface; the stem takes for its point of support the symphysis pubis and

* Schröder. Diseases of the female genital organs, French trans., p. 178.

holds in its curved extremity the fleshy pad which exists behind the pubis, and which varies considerably in thickness according

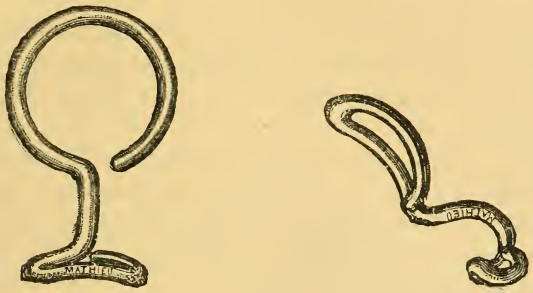

Fig. 249.—Landowski's pessaries.

to the patients; the ring surrounds the cervix uteri. Before introducing it one ought to make certain, by means of rectal

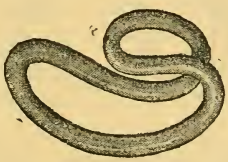

Fig. 250.—Schultze's sledge-shaped pessary.

tactus, that the fundus of the uterus is reduced; then, the pessary being in place, the patient should be made to walk, sit

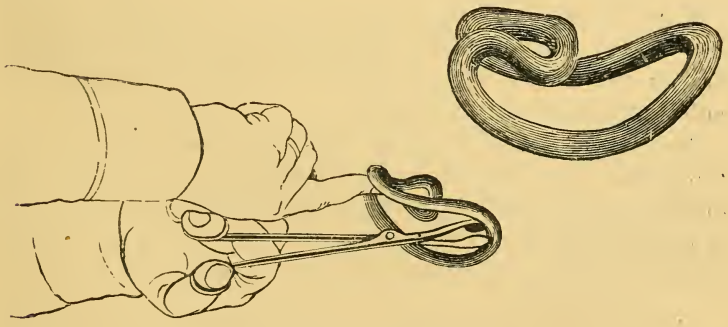

Fig. 251.—Vulliet's pessary.

down, lie down, and one thus ascertains that she does not feel any inconvenience from it, otherwise one has recourse to a

smaller instrument. When the malleable pessary has been well borne, one has another made after the same model, out of aluminium, which should be rigid.

When the perineum is very lax, and the vagina spacious and flaccid, Schultze makes use of a sledge-shaped pessary (fig. 250), which is very like the pessary more recently proposed by Vulliet (fig. 251).

Fritsch* (fig. 252) has combined the pessary of Schultze with that of Hodge (making use of hard caoutchouc instruments); it is more especially during the first days following a reduction that he uses them, after which he replaces them by a Hodge's pessary with a pronounced curve.

All these pessaries are to be applied more easily when the patient is in Sims' position (lateral semi-pronation).

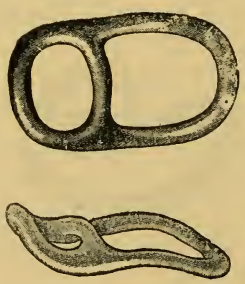

Fig. 252.—Fritsch's pessary.

A good deal has been said in favour of pessaries† having their point of support outside, such as the hysterophores employed for prolapse of the uterus. They are bad instruments, being both inconvenient and unreliable.

Pessaries with a uterine stem were very much in favour a few years ago. They may be useful for keeping up for a few days an uterus which has been reduced with difficulty, and especially as an extra help in certain operations for reduction. Courty‡ used to introduce an uterine galvanic director for a few hours.

* H. Fritsch, Die Lageveränderungen, &c., p. 141.—Professor Tarnier, to meet the same want, has had a transverse bar, with a crescent-shaped curve, and with its concavity turned backwards, fixed to the middle portion of Hodge's pessary.

† G. Thomas. Diseases of women, 3rd edit., pp. 363 and 379.

‡ Courty. Practical treatise on the diseases of the uterus. Paris, 3rd edit., 1881, p. 705.

after he had raised the uterus with the sound, doing this once or twice a week. Alexander also keeps the uterus anteverted with an intra-uterine pessary, after the round ligaments have been shortened. Such are, I believe, the only two proper occasions for applying pessaries with intra-uterine stems in cases of retroflexion.

The specimens recently produced by Chambers, Meadows, &c., although very ingenious, are worth no more than the old ones.

Whatever the pessaries employed, there are many cases where it is impossible to keep the parts in place. Sänger,* according to some very careful statistics, dealing with 57 cases of his own private practice, only had 7 cases of cure, that is, 12·2 per 100, with the use of pessaries, and 27 cases of improvement, that is, 47 per 100; in 15 cases, that is, 26·3 per 100, there was no result locally, although the subjective symptoms were diminished. †

Sometimes it is the extreme mobility of the organ, at others the largeness and laxity of the vagina and the relaxation of the perineum, which cause the pessary to be a failure. In the latter case one may try to combine its use with that of a perineal pad, which often affords great relief to the patients. Should there be at the same time any prolapse of the uterus or procidentia of the vagina, the plastic operations, which will be described in dealing with those affections, will here find a place, and will be an indication for the treatment of the deviation with the pessary.

The patients will always be relieved, especially if the belly is large, by wearing an abdominal belt, which supports the weight of the viscera.

All the same, many women cannot be cured by prosthetic means. One is then justified in resorting to an operation. Two of them are specially deserving of a detailed description—shortening of the round ligaments and abdominal hysteropexy; I shall give a more summary description of the various methods for performing vaginal hysteropexy and intra-abdominal shortening of the uterine ligaments.

* Sänger. Ueber Behandlung des Retroversio flexio Uteri (Centr. f. Gyn., 1885, p. 666.)

† Sänger (*loc. cit.*), gives some erroneous percentages in his work; I have altered them.

The Alquié-Alexander-Adams operation.—The idea of raising or straightening the womb by shortening the round ligaments, which the surgeon can reach with his hand near their termination without causing much damage, belongs to Alquié, of Montpellier.* Two English surgeons, Alexander and Adams, deserve the credit of having re-invented the operation and of performing it almost simultaneously; but it is only just to join their names to that of our fellow-countryman.

Shortening of the round ligaments is a method which has been employed both to maintain the reduction after it has been effected in cases of retroflexion and in cases of prolapse of the uterus; I shall therefore have to refer to it again in dealing with this latter affection.

The operation was at first very indifferently received in England,† in Germany,‡ and in France.§ It was stated, after some insufficient or unfortunate researches, that it was hardly possible to find the round ligaments beyond the internal

* Alquié presented a paper to the Académie de médecine, on Nov. 17, 1840, dealing with a new method for treating the various displacements of the womb (Bull. de l'Acad., 1840-1841, vol. 6, p. 223), but no report was made on the subject. In 1858, Aran (Diseases of the Uterus, p. 1039) mentions Alquié's method, saying: "These are things which, if not impracticable, yet present such serious difficulties in the way of their execution that one cannot exactly recommend them." Nothing occurred to relieve this operation of the discredit into which it had fallen, before it had even been performed, for Deneffe, who tried it in 1864 at Ghent, did an incomplete operation (Presse méd. belge, Sept., 1885), and Freund, in Germany, confined himself to experiments on the dead body (Fritsch, *loc. cit.*, p. 160).—Alexander performed his first operation on Dec. 14, 1881, and published it in the Liverpool Med. Journ., Jan., 1883.—Adams had described the method of operating in the Glasgow Med. Journ., June, 1882, but his first operation was only performed two months after Alexander's. (See for the detailed account, J. E. Maurique, Report on Alexander's operation, Thesis for M.D., Paris, 1886.)

† Brit. Med. Assoc., June 10, 1885.—Obstet. Soc. of Edinburgh, May 25, 1885.

‡ Winckel. Lehrb. der Frauenkr., 1886, p. 363.

§ Doléris and Ricard (Union méd., Nov. 24, 1885), taking as a basis their investigations on 28 dead bodies, maintain "that starting from the internal inguinal orifice, there are, properly speaking, merely some insignificant remnants of the round ligament; none at all in young subjects, none in thin women, none to be found, even if they exist, in very stout subjects, they are rather more visible in certain old women, and after the climacteric." All the same, owing to a contradictory note of Beurnier's (Union méd., Dec. 6, 1885), these same authors made haste to renew (Union méd., Dec. 29, 1885) the very decided opinions they had given in their first report. Doléris also made a communication to the Obstetrical Society of Paris with the same idea of correcting these statements (Nouv. Arch. d'obstet. et de gyn., 1886, p. 90), and since then he has become the most earnest upholder of the operation which he had at first declared to be almost impracticable. Doléris. On the operation for shortening the round ligaments (Nouv. Arch. d'obstet. et de gyn., 1886, pp. 10, 68, 158, 229), and Pathology and treatment of deviations of the uterus (ibid., 1890, p. 32).

inguinal ring. A reaction took place afterwards, and at the present day there are numbers of surgeons in favour of the operation, although the precise indications for it and its advantages are far from being equally appreciated.

I shall describe the method of proceeding with the operation, being guided by Alexander's* account of it, in which he gives his definite practice, and also by my own personal experience. This operation should always be preceded, as a preliminary step, by the free use of the curette.

1st and 2nd stages of the operation. Discovery of the ligaments.—The spine of the pubis being found, an incision is made, parallel to the Fallopian arch, five centimetres long, reaching down to the fascia; with the index finger one can recognise the weak point corresponding to the external inguinal ring, and one proceeds very cautiously to dissect the parts, so as to uncover the columns, as well as the intercolumnar or falciform fibres which form the upper and outer limit of the inguinal canal. An incision is made through the layer of cellular tissue which lies between the pillars of the inguinal ring; flowing from the orifice there is immediately to be seen a collection of fine, yellow fat, to which Imlach † has drawn particular notice. There is a nerve to be put aside (the genital branch of the genito-crural), and with the help of a grooved sound one searches for the round ligament, which appears in the shape of a pinkish cord, occasionally with its lower end pencil-shaped (fig. 253). As soon as it is recognised it should be seized with a pair of forceps, and then cleared of its coverings with some blunt instrument. When that is done, the wound should be covered over with an antiseptic tampon, and the same manœuvre is gone through on the opposite side; the second wound is also temporarily covered over while one is engaged with the third stage of the operation.

3rd stage. Raising the uterus.—The uterus is easily raised with the help of the sound, as Alexander prefers doing it. While an assistant thus raises the organ with additional help from the bimanual method, the surgeon uncovers the wounds, seizes hold of the round ligaments which have been incompletely denuded, and isolates them completely, either with a spatula, or by cutting with a pair of scissors the fibrous bands which unite

‡ W. Alexander. Brit. gyn. Journ., Nov. 1885, p. 246.
* F. Imlach. Edinb. med. Journ., Apr. 1885, p. 913.

them to the neighbouring parts. One should try to go on freeing the parts nearly up to the internal inguinal ring, that is, to the extent of about ten centimetres. If done only to the extent of four or five centimetres, which seemed to some surgeons to be enough, the result, as far as the raising of the uterus is concerned, is merely illusory. To avoid wounding the serous membrane, Professor Duplay proposed * throwing a catgut

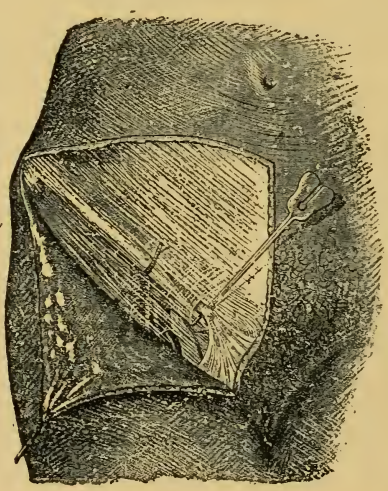

Fig. 253.—The round ligament on the level of the external inguinal ring.

ligature round the most distant part of the intra-inguinal portion of the uncovered round ligament; should the serous membrane have been pulled into the shape of the finger of a glove, the ligature closes the so-formed cul-de-sac. I do not myself perform this part of the operation.

One has to pull equally on both sides. One should be aware that the slightest effort is enough to draw the ligaments forwards, especially when one is using the sound to help the reduction. This facility should not make the surgeon who is a novice think he has ruptured them deeply. One feels some resistance as soon as the traction acts upon the uterus; one has, besides, to ascertain whether this traction transmits certain oscillations to the sound which is placed in the reduced uterus.

* See C. L. E. Beurnier. The round ligaments of the uterus. Thesis for M.D., Paris, 1886, p. 95.

4th stage. Suturing the shortened ligaments; closing the wound.—The surgeon then entrusts an assistant with the care of maintaining the ligaments moderately drawn, whilst he himself sets about to fix them. A curved needle with a silk thread is passed through the external column and the ligament, near its upper border, then through the latter and the internal column, so as to solidly unite to the external inguinal orifice what is going to become the extremity of the round ligament. A second similar suture is passed through the inferior border of the ligament. The whole of the round ligament which reaches beyond the sutures is then cut off. Should it have been necessary to incise the upper part of the semi-lunar fibres and open the inguinal canal somewhat, it should be closed with a continuous catgut suture. Even when these parts have not been incised, I always close the inguinal ring with a continuous catgut suture forming the lowest layer of the deep suture placed in layers by which I close up the wound. It is quite useless to place a drainage tube, if the examination has not been painful, and if the wound is a clean-cut one. The dressing should be antiseptic with a slight amount of pressure.*

* **E.** Casati of Rome (Raccogl. med., 1887, No. 5-8) has proposed a modification in the way of operating. He makes a curved incision joining the two rings; he crosses the extremities of the excised ligaments, and fixes them deeply by a continuous catgut suture.

Doléris (Nouv. Arch. d'obstet. et de gyn., Feb. 25, 1889, p. 49), in those cases where the ligaments are weak and slender, proceeds in a way somewhat analogous to the preceding one, with this difference, that the crossing and the suturing are done under the skin and not on the free surface. The stump loosened from one of its ligaments (the right one) which has been cut at its pubic insertion, is seized with a forceps introduced into the orifice from the opposite side (the left), and brought under the skin in front of the pubis, so as to meet the end of the left ligament, which is brought round to the right incision. The left ligament is sutured to the corresponding columns, and the stump which remains free is resected where its extremity comes in contact with the extremity of the opposite ligament. The coupling and the suturing of these two stumps have to be done after the surfaces have been freshened up. Catgut sutures and drainage should be used.

P. Segond (Bull. et Mém. Soc. de Chir., 1889, p. 268) uses a preliminary silk suture to fix the round ligament in the superior angle of the inguinal canal. He then makes a short incision, similar to the one Reverdin has recommended for suturing the columnar fascia more easily in the radical cure of inguinal hernia. He thus obtains two small button-holes which he makes use of to tie the round ligament round the columnar fascia. Catching hold of the extremity of the ligament which is situated above the suture, he makes it pass alternately from behind forwards through the button-hole of one column, then from before backwards through the button-hole of the other column, and finally he makes it come out through the upper angle of the inguinal canal. He also makes a true knot which he fixes by means of one or two sutures, bringing the columns together and giving more solidity to the ligament after

5th stage.—Alexander mentions 26 cases of retroversion and retroflexion operated upon (up to June, 1885) with uninterrupted success. It is evidently, therefore, a harmless operation. All the same Alexander admits that death did occur in some exceptional circumstances, as may happen after any surgical interference, however insignificant. He knows of three cases, one in his own practice; this latter was one of pyæmia due to undoubted contagion.

Numerous observations have been published in France * and abroad. Trélat, Doléris, Schwartz, and Terrillon have especially dealt most advantageously with easily reducible retroflexions; they have had no mishaps to report. These latter have been mostly observed in other countries. Harrington † has collected the statistics of 140 cases in the practice of 21 operators, with one death.

The operation has now become popularised and is practised everywhere,‡ with variable success, seemingly dependent mostly upon the more or less exact appreciation of the indications for its performance. Besides the important discussions at the Société de Chirurgie of Paris, one should mention those at the Congress of Gynæcology of Munich § and those of the Congress of Halle.‖

Professor Trélat,¶ who has performed Alexander's operation 14 times, out of which five were for retroversions which were movable or adherent, and had been previously reduced at suc-

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it is fixed.—G. M. Edebohls (A modified Alexander-Adam's operation, in New York med. Journ., Oct. 11, 1890, p. 400) incises the whole inguinal canal so as to find the round ligament more easily.—H. P. Newmann (Amer. Journ. of Obstet., 1891, vol. 24, p. 257) claims priority for this modification.

I believe that the more simple method which I have described is quite as effectual as the preceding ones.

* S. Pozzi. Bull. et Mém. Soc. de chir., 1887, p. 93.—Bouilly. Ibid., 1887, p. 134.—Trélat. Semaine méd., July 4, 1888, p. 261, and Bull. et Mém. Soc. de chir., 1889, p. 256.—Doléris, *loc. cit.*—Schwartz. Bull. et Mém. Soc. de chir., 1889, p. 241.—Terrillon, Ibid., 1889, p. 278.—Roux (of Lausanne). Rev. méd. de la Suisse romande, Nov. 20, 1888, p. 645.

† F. B. Harrington. Boston med. and surg. Journ., April 29, 1886, p. 390.

‡ W. Gardner (Austral. med. Journ., Oct 15, 1886, analysis in Centr. f. Gyn., 1887, p. 227) reports 20 cases in his own practice, almost all of them resulting satisfactorily.

§ Verhandl. der deutschen Gesellschaft f. Gyn. (Erster Kongress), 1886, p. 252 *et seq.* (Zeiss, Slavjansky, Küstner, Mundé, Winckel).

‖ Werth (Centr. f. Gyn., 1888, p. 391) has mentioned nine successful cases in his practice, one of which dated one year and a half back, and another one year.

¶ U. Trélat, *loc. cit.*

cessive sittings. He lays down as a strict rule that the shortening of the round ligaments is the operation which is directly indicated for keeping anteverted an uterus previously fixed by adhesions in a state of retroflexion, which can be rendered mobile by the treatment, but cannot possibly be retained by position alone or by pessaries. Besides, as the retrodeviations seem to him to constitute a warning of certain evil in the future, owing to the almost fatal complications, such as metritis and salpingitis, producing adhesions, he believes it to be a good practice to interfere beforehand with any absolutely indolent retroversions, since it is the only way of insuring against future accidents.

This principle seems to me to extend somewhat unduly the field of the operation. I should incline rather to admit Mundé's * advice, who, being greatly in favour of shortening the round ligaments, yet reserves the operation for those deviations which are painful and easily reducible.

Polk has not combined Alexander's operation with hysteropexy, as it was erroneously stated.† He simply, in a case ‡ where he had raised the uterus by a laparotomy, closed the abdomen and performed Alexander's operation.

To sum up, it seems as if the Alquié-Alexander operation is capable of giving excellent and durable results in retroflexion of the uterus. In simple cases the pessary may be preferred, but in cases where the pessary does not fit well. where it is not borne well, and keeps up the reduced uterus in an unsatisfactory manner, the shortening of the round ligaments is a valuable resource. Patients may thus be cured who had been impotent up to the time. It is, however, well to know that the cases which do not cede to the use of the pessary are occasionally sources of disappointment to the surgeon. Küstner § and Keith ‖ have published some instructive observations on the subject.

It is perfectly well proved to-day that the shortening of the round ligaments in no way interferes with the normal course

* Mundé. Amer. Journ. of Obst., Nov. 1888, vol. 21, p. 1131.

† Mundé. Ibid., p. 1137.

‡ W. M. Polk. Hysterorrhaphy and Alexander's operation (Amer. Journ. of Obstetr., June, 1887, vol. 20, p. 630), and Amer. Journ. of Obstetr., Dec., 1888, p. 1271. —See on this point, M. Baudouin. Thesis for M.D., Paris, 1890, p. 167.

§ Küstner. Centr. f. Gyn., 1888, p. 259.

‖ S. Keith. An unsuccessful case of Alexander's operation. Obstet. Soc. of Edinburgh, May 12, 1886 (Brit. gyn. Journ., 1886, vol. 2, p. 408).

of pregnancy, and does not complicate labour. It seems even as if the deviation had no tendency to recur after a confinement. Several cases of pregnancy and labour at full time have been published. Alexander,* out of eight cases of pregnancy, has seen seven of the patients he had operated upon happily delivered. Polk has observed pregnancy in a woman who had been operated upon for adherent retroversion. She aborted at the fourth month. Doléris has observed pregnancy seven times, and Imlach twice.

Colpo-hysteropexy, or *vaginal hysterectomy*.—The first attempts to operate by way of the vagina, in fixing a uterus which had been reduced and brought back into a good position, are of somewhat ancient date. Amussat,† in cases of ante- or retroversion, applied the actual cautery to the side opposite to that of the deviation, so as to produce a cicatricial band to draw the organ over. Courty‡ maintains that he got very good results from this singular mode of treating cases of anteversion. He admits that it is not without some danger in retroversion, owing to the proximity of the peritoneum, and yet he does not condemn it.

Richelot, senior,§ has proposed getting the cervix fixed to the posterior wall of the vagina. Bossi‖ has recently described an analogous process under the name of vagino-fixation of the cervix.

With the same object in view, a suture has been passed through a transverse fold made in the vagina, so as to shorten both the walls of that canal. Sims has done this three times for anteversion.

Byford¶ has performed, in women who had passed the meno-

* W. Alexander. Reciprocal effects of pregnancy and parturition upon the operation of shortening the round ligaments of the uterus. (Brit. Med. Journ., Feb. 14, 1891, p. 348.)—Polk. Removal of one tube and ovary; the other allowed to remain although diseased; Alexander's operation, marriage and pregnancy. (Amer. Journ. of Obstet., June, 1890, p. 627).—Doléris. "The physiological object-glass in gynæcology. The need of a conservative surgery," read at the Berlin Congress, 1890. (Nouv. Arch. d'obstet. et de gyn., 1890, vol. 5, p. 498).—Imlach. Edinb. med. Journ., April, 1885, p. 914.

† Amussat. Reports of the Académie des Sciences, fevr., 1850.—Philippeaux. On cauterisation, Paris, 1856, p. 557.

‡ Courty, *loc. cit.*, p. 654.

§ Richelot, senior. Union méd., 1868, Nos. 58 and 59.

‖ S. M. Bossi (of Genoa). Riv. di ost. e gyn., Oct. and Nov., 1890.

¶ Byford. Diseases of women. Philadelphia, 1888, p. 526.

pause, a metro-elytrorrhaphy somewhat analogous to the operation of Richelot senior: this is the union of the anterior vaginal wall, or of the anterior surface of the cervix with the posterior wall of the vagina.

Doléris,* according to the case, performs a pre-cervical or retro-cervical colporrhaphy, after having reduced the deviation.

When the anterior vaginal wall seems too short, Skutsch has advised having it made longer by making a transverse incision which is united lengthwise.†

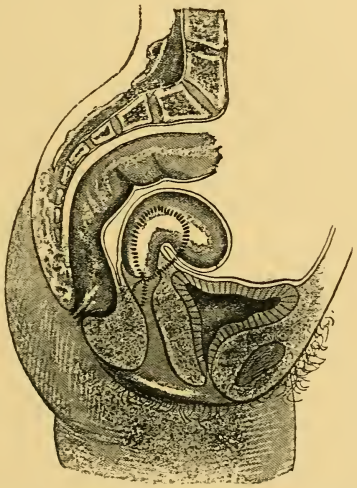

Fig. 254.—Vaginal hysteropexy. Operation of Schücking (of Pyrmont).

Schücking (of Pyrmont‡) has tried fixing the fundus uteri to the vesico-uterine cul-de-sac (fig. 254); he makes use of a

* Doléris. Treatment of uterine flexions (Gaz. des. Hôp., 1888, No. 3, p. 23).

† Skutsch. Discussion at the Congress of Halle (Centr. f. Gyn., 1888, p. 392).

‡ A. Schücking. Eine neue Methode der Radicalheilung der Retroflexio uteri (Centr. f. Gyn., Mar. 24, 1888, No. 12, p. 181, and No. 42, p. 682); Bemerkungen über die Methode der vaginalen Fixation bei Retroflexio und Prolapsus Uteri (Centr. f. Gyn., 1890, No. 8, p. 123), and Bemerkungen zur vaginalen Ligatur des Uterus, &c. (Centr. f. Gyn., 1891, No. 13, p. 249).—Weitere Erfahrungen über die vaginale Ligatur bei Retroflexio und Prolapsus uteri (Deutsche med. Woch., 1891, No. 10). He declares that his process has been employed in 217 cases: 88 patients were followed up during a sufficient length of time as regards ulterior results; there were amongst them only four failures. The author obtained 30 cures of adherent retroflexions by his method; the threads are only removed after six weeks, and immediately after the operation a pessary is placed in the vagina and kept in for about 23 weeks.—Out of 217 cases of vaginal ligature, are reckoned 23 cases of delivery at full term, after the operation (Centr. f. Gyn., 1891, No. 20, p. 394).—Klotz (Centr. f. Gyn., 1891, No. 4, p. 98 and

needle on a handle holding a double thread, which he passes into the reduced and dilated uterus, and pierces the vaginal cul-de-sac, which is firmly depressed, until he reaches the organ. Zweifel,* to make sure of not wounding the bladder, begins by opening the anterior cul-de-sac. In spite of this modification, which Schücking regards as excellent, and in spite of the success which has been recorded, this proceeding, of which I have no experience, seems to me *a priori* to be disparaged.

Von Rabenau† has proposed incising the cervix, then opening the anterior cul-de-sac and separating the uterus from the bladder by some blunt instrument; the anterior wall of the uterus is then excised for about 4 centimetres and the wound is sutured. This method has been copied by Schmidt (of Cologne).‡ Fränkel§ has quite justly found fault with him for dragging the cervix so strongly forwards, owing to the cicatrisation, that the body of the uterus has a tendency to fall backwards.

Sänger‖ has in theory taken up Schücking's idea; but his method of suturing the fundus of the uterus to the anterior vaginal cul-de-sac, as he proposes, would be different; a transverse opening is made into the anterior cul-de-sac of the vagina and into the cul-de-sac of the peritoneum behind the bladder, the body of the uterus is sutured to the vagina with silver wire; the vaginal wound is then closed up, following a vertical line so as to prolong the anterior wall of that canal and allow the cervix to fall backwards.

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written communication) has himself seen normal delivery take place in 11 out of 81 patients operated upon; in one only turning had to be performed and retroflexion recurred.—C. Thiem (of Kottbus), Congress of German naturalists at Heidelberg, Sept., 1889 (Centr. f. Gyn., 1889, p. 735), has slightly modified Schückling's operation, and thereby at once obtained 36 successful cases.—W. Rühl (Bemerkungen über die Schücking'sche Methode, &c., in Centr. f. Gyn., 1890, No. 51, p. 916, mentions 14 new cases of Thiem's, followed by success, and 4 cases of his own.—See also Debrunner. Zur vaginalen und ventralen Fixation der rückwärtsgebeugten Gebärmutter (Corr. Bl. f. Schweitz. Aertze, 1890, No. 11, p. 337).—H. Hartmann. On vaginal hysteropexy in the treatment of uterine retro-deviations. (Ann. de Gyn., June 7, 1890, p. 453.)

* P. Zweifel. Ueber die Vaginalfixatio uteri, &c. (Centr. f. Gyn., 1890, No. 39, p. 689).

† v. Rabenau. Ueber neue operative Behandlung der Retroflexio Uteri (Berl. klin. Woch., May 3, 1886, No. 18, p. 284).

‡ Schmidt. Centr. f. Gyn., 1888, p. 685.

§ Fränkel. Deutsche med. Woch., 1888, Nos. 45 and 46.

‖ Sänger. Centr. f. Gyn., 1888, No. 9, p. 17, and No. 3, p. 34.

Another way, according to the same author, might be employed: after dilating the uterus the finger is introduced into its cavity, and using it as a guide, a metal wire is placed directly in the organ, passing through the anterior cul-de-sac of the vagina, which is left intact.

It is probable that in the course of time, more or less distant, we shall see these ingenious hypotheses realised, or at least tried.

Richelot* has been very strong in praising a method which is due to Nicolétis, and which has for its object to raise the uterus by getting a point of support on the posterior wall of the vagina and the perineum. Supra-vaginal amputation of the cervix is first of all performed, then three catgut threads are passed through the posterior part into the vagina and the stump of the uterus so as to make them come out by the orifice of the uterine cavity. These three threads are in the middle line; on either side of them, right and left, two others are passed, starting also from the posterior wall of the vagina and passing out, not through the orifice, but through the anterior edge of the stump, so that the posterior vaginal wall is hooked into this edge, clinging to the cut surface of the uterus. The parts are brought into better apposition by some superficial stitches. The object of the surgeon is thus, while maintaining the orifice, to get the posterior wall of the vagina to stick to the anterior edge of the stump. The whole of the vaginal insertion is carried forwards; the wall drags upon the parts like a bell-pull and causes the fundus of the uterus to turn over, at least at the time of the operation (fig. 255). It is, I believe, a fact that to count upon a mechanical effect to be durable is an illusion; the constant extensibility of the vagina and the frequent flaccidity of the perineum reduce this method to nothing but an ingenious theoretical conception. The good results which have been obtained from it are simply owing to the amputation of the cervix, which then has an effect upon the metritis.†

* Richelot. On vaginal hysteropexy (Reports of the 4th Congress of Surgery. Paris, 1889, p. 482.—Bull. et Mém. de la Soc. de chir., Dec. 11, 1889, p. 765;—Union Méd., Dec. 17, 1889).—L. H. Debayle. On vaginal hysteropexy (Nicolétis' operation). Thesis for M.D., Paris, 1890.—Nicolétis never published anything before these works; he performed his first operation on the dead body in 1889, and Richelot his first on a living person in June, 1889 (Debayle, *loc. cit.*, p. 39).

† U. Trélat and S. Pozzi. Bull. et Mém. Soc. de chir., 1889, p. 771.

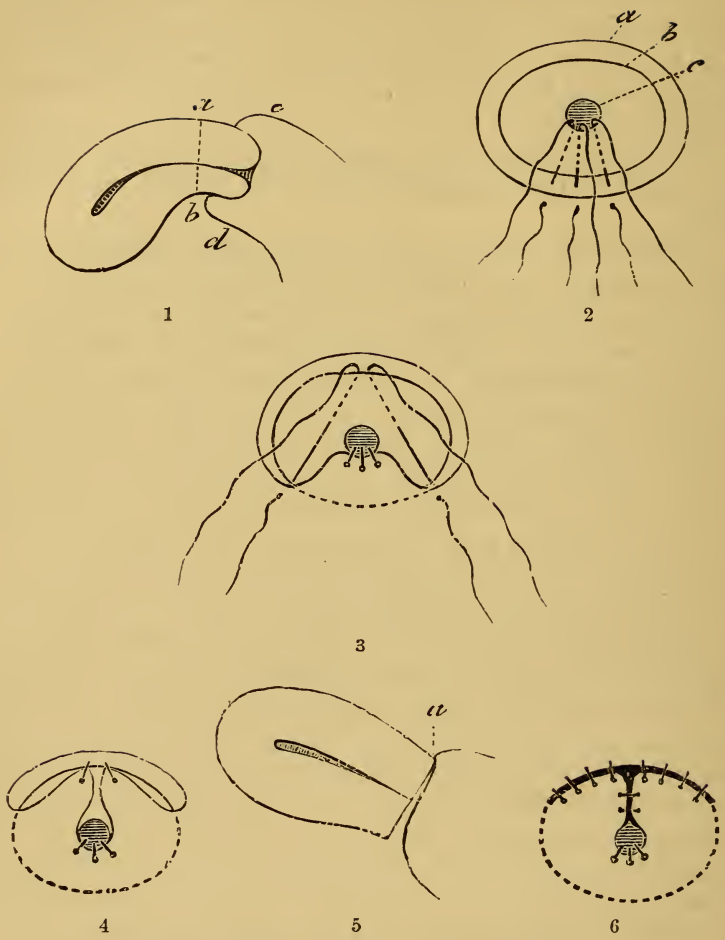


Fig. 255.—Vaginal hysteropexy. (Nicolétis' method.)

1.—The retroverted uterus. *a*, *b*, line through which the section should pass; *c*, *d*, vaginal walls.

2.—The uterine stump seen from the front after supra-vaginal amputation. Introduction of the three median threads. *a*, vaginal wall; *b*, anterior edge of the stump; *c*, uterine orifice.

3.—Fixation of the posterior vaginal wall to the uterine orifice. Introduction of the two lateral threads.

4.—Fixation of the posterior vaginal wall to the anterior edge of the stump.

5.—The uterus raised up. *a*, insertion of the two vaginal walls into the anterior edge of the stump.

6.—The suture completed.

Péan,* under the name of vagino-fixation, has described the following method: the recto- and vesico-vaginal walls are seized hold of with some strong forceps, kept as far outwards as possible, the two walls of the vagina are separated as far as possible; without freshening up the parts an aneurism-needle is passed as deeply as possible through the lateral wall of the vagina from before backwards in its whole breadth, taking up a good thickness of sub-mucous tissue. Some loops of thread are thus passed through the whole length of the vagina at intervals of two centimetres. The wall of the vagina is in this manner sutured to a corresponding part of the pelvis. The threads are left in place and cut the tissues, producing cicatricial bands running transversely and quite deeply, as far as the neighbourhood of the bones. This operation does not prevent perineorrhaphy being performed as a supplementary operation, and it is as well for the patient to wear a pessary. Péan has only once carried out this proceeding, and the later results have not been mentioned. The method seems *a priori* dangerous and not very efficacious.

Under the name of vaginal hystero-gastrorrhaphy Candela† has described a complicated operation, in which the intestine runs the risk of being wounded, and where the advantage gained is but doubtful. In one case only has it been performed. I merely mention it in passing.

Posterior pelvic colpo-hysteropexy.—Such is the name which might be given to the operation performed by Freund,‡ both in cases of prolapse and in cases of serious retroflexion with great

* Péan. Bull. méd., Feb. 27, 1889.

† Candela, in Dumoret. Laparo-hysteropexy, &c. Thesis for M.D., Paris, 1889, p. 23.—Répert. univ. d'obstet. et de gyn., 1889, p. 271.

‡ Freund. 3rd Congress of German gynæcologists, Friburg, June, 1889 (Centr. f. Gyn., 1889, No. 30, p. 515). The idea of Freund's operation is found as a suggestion in the ideas formulated by Schultze (Zeitschr. f. Geb. und Gyn., 1888, Bd. 14, heft 1, p. 23), who had proposed the following procedure: a transverse opening to be made in the posterior cul-de-sac of the vagina; liberation of the uterus and appendages; reduction of the uterus; cutting off of Douglas' pouch by sutures, so as to draw the cervix backwards. Sänger (Centr. f. Gyn., 1888, No. 2, p. 17) has also raised the question as to whether one might not induce the formation of adhesions for the cure by opening Douglas' pouch and plugging it with iodoform gauze. He went so far even as to propose (ibid., No. 3, p. 40) making injections of alcohol in the neighbourhood of the utero-sacral ligaments and in the retro-cervical cellular tissue, hoping in this manner to produce anteversion by the retraction of these ligaments. It would certainly be a bold measure, and one would be likely to see the inflammation reaching beyond all the means one has of checking it.

development of Douglas' pouch. He thinks that one or other of these displacements of the uterus is occasionally due to the persistence of the great size this fold has in the fœtus; up to the seventh month of intra-uterine life it descends in fact as far as the middle of the vagina. Freund makes a large opening into the posterior vaginal cul-de-sac, opens the peritoneum, and sutures the posterior surface of the supra-vaginal portion of the cervix to the serous covering situated above the promontory in the neighbourhood of the utero-sacral ligaments; he takes great care in this manœuvre to avoid wounding the rectum. He then plugs Douglas' pouch with iodoform gauze and shuts up the vaginal wound. Later on he forms a new perineum if necessary.

This operation, which practically amounts to a radical cure of the congenital hernia into Douglas' pouch, has been performed by Freund in two cases of retroflexion complicated with that kind of hernia.

It does not seem as if pelvic colpo-hysteropexy should be a less dangerous, and at the same time a more efficacious operation than abdominal hysteropexy.

Most of the methods for vaginal hysteropexy have a double defect: they act directly upon the fundus of the reduced uterus and fix the organ to movable and extensible tissues. This objection does not exist when the uterus is sutured to the abdominal wall.

Gastro-hysteropexy, or fixation of the uterus to the abdominal wall (ventro-fixation, gastro-hysterorrhaphy, gastro-hysterosynaphy.

Historical notice.—It has often been observed, when the pedicle of an ovarian cyst was being fixed outside the abdomen, that this manœuvre had a most favourable effect upon any displacement of the uterus. Hence originated the idea of fastening that organ to the abdominal wall by means of the broad ligaments, with or without the removal of the ovaries, or directly on the level of its base. Koeberlé * has the credit of having per-

* Koeberlé. Irreducible retroversion of the womb. Obstinate constipation followed by ileus. Gastrostomy and ovariotomy with the object of fixing the uterus permanently to the abdominal wall. Cure (Bull. et Mem. de la Soc. de chir., 1877, p. 64).

Schröder (Dis. of the female genital organs, French translation, p. 181), who mentions this operation when referring to Schetelig (Centr. f. med., Wissensch., June, 1869, p. 417), says "that he brought the uterus forwards and united it at the same time as the pedicle of an ovarian cyst to the lower edge of the wound." This is an error, there was no ovarian cyst; the confusion arose out of the word ovariotomy, employed by Koeberlé.

formed the first operation of this sort. On the 27th of March, 1869, in a case of retroflexion giving rise to symptoms of chronic intestinal obstruction, he incised the abdominal walls, brought the uterus forwards, removed a healthy ovary, and sutured the pedicle to the lower edge of the wound.

Sims,* on the 18th February, 1875, performed laparotomy in a woman aged 32 years, who was suffering from an exceedingly painful retroflexion. He removed the left ovary, which was the size of a walnut and undergoing cystic degeneration, and fixed the pedicle in the angle of the incision, so as to retain the uterus in its normal position. The patient made a perfect recovery. Schröder,† a little later on, having attended a patient suffering from retroflexion complicated with symptomatic chorea, and having at the same time a small cyst of the ovary, witnessed the disappearance of the retroflexion and the chorea after ovariotomy had been performed and the pedicle had been fixed to the abdomen. Lawson Tait,‡ on the 26th February, 1880, performed laparotomy in a woman suffering from ovaritis and retroflexion of the uterus, and for whom no means of relief had been found. He found the ovaries enlarged, soft, and with no cysts. He removed them, and, when closing the abdominal wound, he passed one of his sutures through the fundus of the uterus, which he fixed to the wall. A second analogous operation was performed on the 9th of April, 1880. Both cases could still be looked upon as cured in 1883. Hennig,§ in 1881, after a case of castration, sutured the round ligaments, the broad ligaments, and the fundus of the uterus to the integuments, by way of dealing with a very obstinate retroflexion.

These, however, were merely isolated facts, taking place with no definite method. Olshausen‖ was the first to describe the

* Sims. Brit. med. Journ., Dec. 10, 1877, p. 840.—Courty (Practical treatise on the diseases of the uterus, 3rd edit., 1881, p. 707) when mentioning the two preceding observations, adds: "It is not as examples to be imitated that I make mention of these operations."

† Schröder. Berl. klin. Woch., 1879, No. 1, p. 1.

‡ L. Tait. The pathology and treatment of diseases of the ovaries, 4th edit., 1883, pp. 93 and 96.

§ Hennig (of Leipzig). Centr. f. Gyn., 1886, No. 41, p. 667.

‖ Olshausen. Ueber ventrale Operationen bei Lage-anomalien (59th Naturforscher Samml. zu Berlin, Sept. 20, 1886, anal. in Centr. f. Gyn., 1886, p. 667). The complete work has been published under this title: Ueber ventrale Operation bei Prola sus und Retroversio Uteri (Centr. f. Gyn., Oct. 23, 1886, No. 43, p. 698).

operation systematically in a work which served to really initiate it. In it he gives an account of three remarkable cases (the first only having to do with retroflexion, the other two with prolapsus). By means of several (non-absorbent) worm-gut sutures he joins that part of the round ligaments and the broad ligaments which is near the uterine horns to the abdominal wall, taking great care to feel the parts first of all, and to avoid the epigastric artery. In a case where the menopause is about to come on, he removes the ovaries, but he mentions that this addition to the operation is purely as a contingency.

At the Congress where Olshausen's paper was read, a discussion * followed upon a report of Fraenkel's, and some new facts were mentioned, some belonging to Bardenheuer (cited by Frank), the others to Czerny.

Shortly after, Kelly,† of Philadelphia, published, with the analysis of part of the preceding works, an interesting report of a case of retroflexion cured by the removal of an ovary and the fixation of the pedicle to the abdomen. The other ovary had been extirpated some time before through a vaginal incision. At the same time Kelly gave a short account of two cases, not previously published, in which Sänger performed castration and sutured the broad ligaments to the abdomen.

This latter published a very complete paper on the subject, dealing with seven of his own cases.‡ Since then he has performed ventro-fixation 12 times; in nine cases he removed the appendages.§

Klotz‖ had already in 1887 made a report to the Gynæcological Society of Dresden of 17 cases of fixation of retroflected uteri to

* Meeting of Sept. 20, 1886 (Centr. f. Gyn., 1886, No. 42, p. 685).

† Howard A. Kelly. Hysterorrhaphy (Amer. Journ. of Obstet., Jan., 1887, vol. 20, p. 35). The work of H. Kelly was read before the Obstet. Soc. of Philadelphia, on Nov. 4, 1886 (Amer. Journ. of Obstet., vol. 20, p. 67), but it was only published in Jan., 1887, after numerous additions taken from Olshausen's work, which had been publicly read on Sept. 20, 1886, and published in the Centralblatt as early as Oct., 1886.

‡ M. Sänger. Ueber operative Behandlung der Retroversio-flexio Uteri (Centr. f. Gyn., 1888, Nos. 2 and 3, pp. 17 and 34.)

§ M. Sänger. Ueber Schwangerschaft nach conservativer Ventrofixatio uteri retroflexio (Centr. f. Gyn., 1891, No. 16, p. 305). This work was read before the Obstetrical Society of Liepzig, March 16, 1891.

‖ Klotz. Gynæcolog. Soc. of Dresden, Oct. 6, 1887 (Centr. f. Gyn., 1888, No. 1, p. 11, and (*in extenso*) Berl. klin. Woch., 1888, No. 4).—For the discussion raised on this occasion between Klotz and Sänger, see Centr. f. Gyn., 1888, No 5, p. 69, and ibid., p. 102.

the abdominal wall by means of a pedicle formed out of the tube going to the ovary.

Leopold,* one month later, presented three successful cases, after fixation of the fundus itself to the abdominal wound.

H. Kelly,† in America, brought out in May, 1888, a new work, in which he had collected several facts which had remained unpublished: 4 cases of P. Zweifel for retroflexion (hysterorrhaphy without castration), 1 case of Stande's for retroflexion (hysterorrhaphy with removal of a single ovary, it not being possible to remove the second on account of the adhesions).‡

* Leopold. Ueber die Annähung der retroflektirten Gebärmutter an der vorderen Bauchwand. Communicated to the Gynæcological Soc. of Dresden, Nov. 3, 1887 (Centr. f. Gyn., 1888, No. 11, p. 161).

† H. Kelly. Hysterorrhaphy (Amer. Journ. of med. sciences, 1888, p. 468).

‡ These are true examples of hysteropexy. One cannot place on the same rank the supplementary operations performed successively in the course of another operation. It is probable that many laparotomists have performed, without the case being published, the supplementary or occasional fixation of the uterus, after the removal of a cyst of the ovary or of a fibroid, to cure a retroflexion or a prolapsus of the uterus. It is what I did myself in April, 1882, fixing the pedicle of an ovarian cyst and thus curing a prolapsus of the uterus; this case was mentioned for the first time only on a discussion taking place on hysteropexy (Soc. de chir., Nov. 11, 1888), and published *in extenso* in Dumoret's thesis, *loc. cit.*, 1889, p. 119.

Czerny, in the course of a laparotomy, had introduced a similar kind of suture into the ovarian pedicle for a retroflexion, and had brought the case forward on June 15, 1886, before the Rhenish Med. Soc. at Darmstadt, but the fact was only published in 1888. V. Czerny, Ueber die Vornähung der rückwärts gelagerten Gebärmutter (Beitr. zur klin. Chir., 1888, Bd. 4, p. 164). Up to that time he had performed this supplementary hysteropexy three or four times out of 46 ovariotomies.

It is hardly right to count amongst the supplementary hysteropexies the fixation of a pedicle which is required after supra-vaginal amputation (Müller. Corresp. Blatt. f. Schw. Aertze, 1878, Nos. 20 and 21). The fixation of the uterus, after the removal of a sub-peritoneal myoma, is much more like a special operation (Kaltenbach. Zeitschr. f. Geb. und Gyn., 1878, Bd. 2, p. 188).

Brennecke, of Magdeburg (mentioned by Kelly, *loc. cit.*, p. 473), has sutured the right horn of the uterus to the abdomen, in the course of an ovariotomy (in 1883) to remedy a state of prolapsus (success) In a second case, in the course of an ovariotomy, he sutured the two horns of the uterus for prolapsus (failure); another operation was performed on the patient: suturing the pedicle (ovarian) to the abdominal wall (1885-1886.)

With the exception, may be, of this last operation, these facts have nothing in common with hysteropexy performed in the first instance, and with a deliberate purpose.

Werth (of Kiel), in 1887 (mentioned by Kelly, *loc. cit.*, p. 474) when performing a castration to cure some hæmorrhage, sutured the pedicles to the wall so as to cure an extreme retroflexion at the same time. In 1884, in another ovariotomy for a dermoid cyst, Werth sutured a retroflected uterus to the peritoneum of the bladder with silk. This is not a ventro-, but a vesico-fixation or a cysto-hysteropexy. A case of Weist's (quoted by Kelly, *loc. cit.*, p. 475), where it is mentioned that after an ovariotomy the pedicle was fixed to the abdomen to cure a prolapsus, should be included amongst the casual operations of a very different kind to true gastro-hysteropexies.

In England Phillips* has published one case of ventro-fixation (for prolapsus). Schauta† has reported four cases in his practice. Czerny,‡ in an important publication which appeared in October, 1888, gave four cases of gastro-hysteropexy and described the method. In France Terrier and Picqué were the first to practise the operation; Terrier in the month of March, 1888, for a retroflexion, in the month of August, 1888, for a prolapsus; and Picqué, in the month of September,§ for a retroflexion.

Since then the cases reported have increased considerably in numbers in France,‖ as well as abroad, and their enumeration would not offer the same interest as in the early days of hysteropexy.

Technics of the operation.—Three principal methods and various secondary ones may be distinguished.

1. *The method of indirect fixation* (Koeberlé, Klotz).—The ovary or the tube having been first of all removed, the pedicle is fixed to the abdominal wall. Klotz, who has applied his method in 38 cases,¶ lays great stress upon the importance of fixing a glass tube behind the uterus reaching down into Douglas' pouch, which has to be withdrawn after a short time, and has the effect of bringing on the formation of adhesions.

This method is inconvenient, because the ovary is sacrificed, the uterus torn, and only an indifferent union is produced; it has failed several times.**

* Phillips. On ventral fixation of the uterus for intractible prolapse (Lancet, Oct. 20 1888, vol. 2, p. 760).

† Schauta. Prag. med. Woch., 1888, No. 29 (Anal. in Centr. f. Gyn., 1888, No. 45, p. 733).

‡ V. Czerny, *loc. cit.*, 164.

§ S. Pozzi. Report on a case of Picqué's (Bull. et Mém. de la Soc. de chir., Dec. 5, 1888, p. 936).—Terrier. Ibid., Nov. 28, 1888, p. 901.

‖ I have myself performed hysteropexy several times for retroversion with success. In one of my patients the shortening of the round ligaments had been brought about some months before by some skilful surgeon and was followed by no result. S. Pozzi. Annal de Gyn., May, 1890, vol. 33, p. 353.

For the complete bibliography of the subject, see an excellent work by Marcel Baudouin (Anterior abdominal hysteropexy and supra-pubic operations for retroversions of the uterus, Paris, 1890), who has collected 235 cases of hysteropexy performed for retrodeviations up to July, 1890.

¶ C. L. Klotz. Centr. f. Gyn., 1891, No. 4, p. 97.

** The author of a recent article on gastro-hysteropexy was wrong in considering as a process analogous to that of Klotz a very brief indication given by Polk (Trans. of the Amer. Gyn. Soc., Sept., 1887, Amer. Journ. of Obstet., 1887, vol. 20, p. 1045) in a work with the following title: "Should the tubes and ovaries be sacrificed in all cases of salpingitis?" Polk merely says that when the deviation backwards of the uterus was

2. *Method of performing lateral direct fixation of the body of the uterus* (Olshausen-Sänger).—The sutures are introduced on either side, away from the fundus, but on the level of its edges, silkworm gut being used. Care has to be taken that the suture does not catch up the anterior serous fold, and that no puncture is made into the tube or the epigastric artery (figs. 256 and 257). One disadvantage of this method is that a sort of slit or button-hole is formed between the uterus and the abdominal wall, which may be a cause of internal strangulation.

Kelly's method * resembles Olshausen's, and does not deserve a special description. This surgeon fixes the horns of the uterus on the level of the insertion of the round ligaments to the

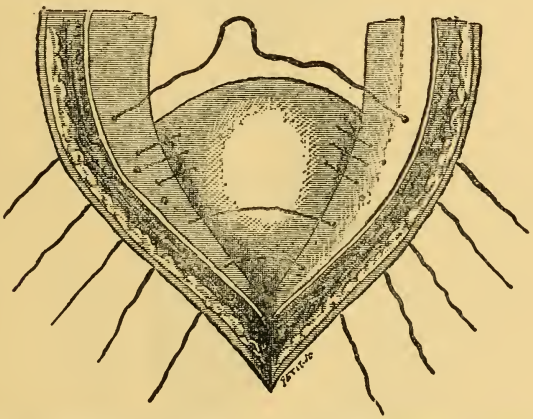


Fig. 256.—Gastro-hysteropexy. (Method of Olshausen and Sänger.)

parietal layer of the serous membrane, after having removed the ovary.†

3. *Method of performing median direct fixation of the body of the uterus* (Leopold, Czerny, &c).—Leopold fixes the

due to the action of the appendages, "he tried on two occasions, after having separated the adhesions, to remedy matters with a simple drainage tube; but he did not get such good results as he did later on when applying Alexander's operation to the same case." No fixation of the uterus was therefore to be found here, but simply some raising of the organ, whereas Klotz proceeds carefully to suture the pedicle of the ovary or tube.

* H. A. Kelly. Hysterorrhaphy (Amer. Journ. of med. sciences, May, 1888, p. 468).

† Kelly (New York med. Journ., Oct. 5, 1889, p. 383, and "on Hysterorrhaphy" in John Hopkins Hosp. Rep., Jan., 1889, No. 2, p. 17, has described a new method of intra-peritoneal hysteropexy, which does not seem much superior to the first. See Baudouin, *loc. cit.*, p. 81.

fundus itself to the abdominal wall. The abdomen having been opened, and the uterus being raised after rupture of the adhesions, a strong needle holding a silk thread is passed through the entire thickness of the abdominal wall from before backwards, a little outside the edges of the wound, on a level with the organ. One should enter the thickest part of the tissue of the womb at the highest part of the anterior wall, in the line where the insertions of the two round ligaments meet. The needle travels under the serous membrane and the superficial layer of muscular tissue for an extent of 1 centimetre, then it passes in again, this time from behind forwards, into the abdominal wall on the other side of the wound. A second suture is placed over

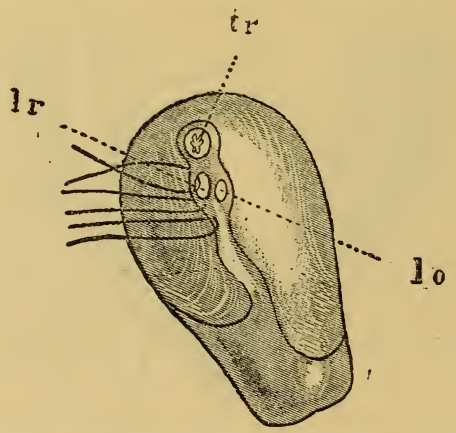


Fig. 257.—Gastro-hysteropexy. (Method of Olshausen and Sänger.) Side view, showing the course of the threads; *tr*, Fallopian tube; *lr*, round ligaments; *lo*, ligament of the ovary.

the first, on the transverse line which joins the insertions of the two tubes, which should be 2 centimetres wide, and a third a little above the second, in the same way.

To facilitate the adhesion on this level, Leopold gently scrapes with the back of a knife the peritoneal covering on the surface of the uterus, over the space surrounded by his sutures, freshening up the parts superficially, without making them bleed, but merely removing the epithelium. The two edges of the abdominal wound should now be joined together at this level, these three sutures being tightened and tied in a knot above the abdominal wall (fig. 258), so that the anterior surface

of the uterus is applied exactly at this point to the parietal peritoneum. One then proceeds to unite the remainder of the wound, above and below. The sutures in the uterus are re-

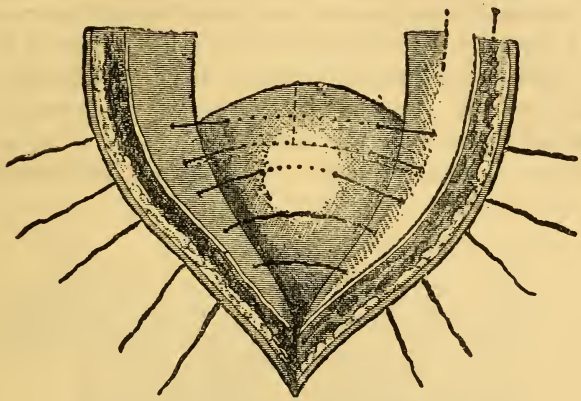


Fig. 258.—Gastro-hysteropexy. (Leopold's method.)

moved after twelve or fifteen days. By refraining from using deeply placed sutures, Leopold believes that he sets up adhesions that are more lax, looser, and less likely to trouble the bladder.*

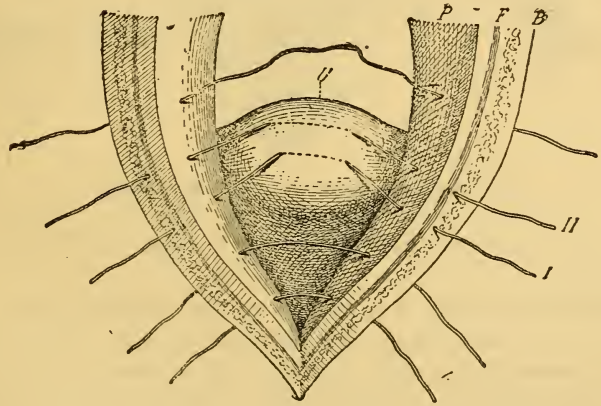


Fig. 259.—Gastro-hysteropexy. (Czerny's method.)

It is as well to introduce a Hodge's pessary for a month, to help the sutures to retain the good position they have acquired.

Czerny† pierces the anterior wall near the fundus of the

* Leopold. Centr. f. Gyn., 1888, No. 11, p. 161, and ibid., 1890, p. 185

† Czerny. Beitr. zur klin. Chir., 1888, Bd. 4, heft 1, p. 179.

uterus with a very strong needle, holding catgut which has been made septic with the perchloride (he used previously to employ chromicised gut). The needle first of all passes through the aponeurosis and the peritoneum, and travels under them a second time in a contrary direction, but without including the integuments in the suture, which makes it differ considerably from Leopold's method. One or two threads are thus passed, care being taken not to drag the uterus, and to fix it at a point where it can be easily applied. The threads are knotted, the

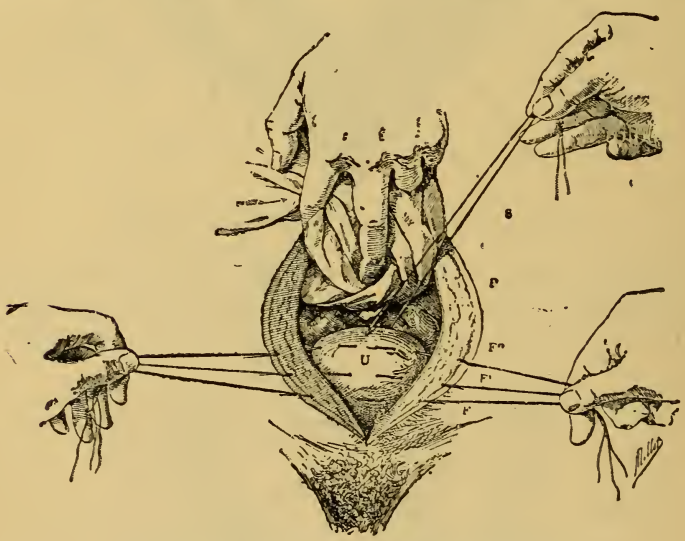


Fig. 260.—Gastro-hysteropexy. (Terrier's method.)

ends cut off, and the abdominal wall is then sutured above all (fig. 259).

Terrier's* method is a variety of the preceding one. He begins by passing a temporary silk thread into the fundus of the uterus, penetrating a very short way into its tissue, so as to drag the organ upwards. A strong piece answers for the definitive sutures, which are three in number on the anterior wall of the uterus: the first on a level with the junction of the cervix and the body, the second near the middle of the body, the third close to the fundus. These threads pass through the superficial layer of the uterus and the whole thickness of the abdominal wall,

* Dumoret, *loc. cit.*

with the exception of the cellular tissue and the skin. Thus it really differs entirely from Leopold's method, but the only difference from that of Czerny is in the care taken by Terrier in using his threads, to tack in such a manner that a portion of the thread is not hidden in the thickness of the tissues, and to get it between the anterior surface of the uterus and the abdominal wall. He thinks there is thus more certainty in bringing about the adhesions (fig. 260). When these sutures are knotted they constitute deep-seated sutures, above which the integuments are united, above with three silver wire threads passing through the

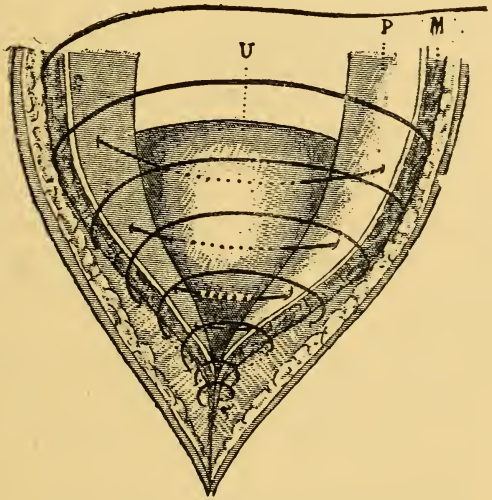


Fig. 261.—Gastro-hysteropexy. (Pozzi's method.)
The anterior surface of the uterus fixed by a continuous suture.—U, uterus; P, peritoneum; M, musculo-aponeurotic layer.

peritoneum, and below with three threads of silkworm gut, on a level with the sutures of the uterus. A small drainage tube is placed in the inferior angle of the wound.

For my part, in performing hysteropexy, I employ the continuous suture, which is always useful for holding the parts together, if they are of any great extent. The following is the method, a very simple one, of performing the operation.

1*st stage*.—An incision is made through the abdominal wall, in the median line, for an extent of eight centimetres, ending at a distance of two fingers' breadth above the pubis.

2*nd stage*.—The index and middle fingers of the right hand

are introduced into the wound; the fundus of the uterus is sought for, liberated, and then brought forward. Meanwhile it is as well for an assistant to raise the organ with his fingers introduced into the vagina.

3rd stage.—The body of the uterus is provisionally fixed with a pair of vulsellum forceps placed very superficially in the middle line of the fundus, where the teeth of the instrument can get a firm grasp without causing any hæmorrhage. This is held by an assistant, who thus raises the organ. The surgeon, by means of one of Hagedorn's needles holding a piece of fine but strong silk thread, passes two stitches into the inferior part of the wound, comprising the whole of the serous, fibrous, and muscular coats of the abdominal wall so as to insure having firm support. Then he rapidly introduces a continuous suture in an upward direction, the spiral of which passes transversely through the whole of the deeper part of the abdominal wound (the skin and cellular tissue excepted) the superficial layer of the uterus in the middle line, then the other edge of the abdominal incision; three or four stitches suffice. As soon as the uterus is thus fixed to the anterior wall, the continuous silk suture is brought to an end (fig. 261).

4th stage.—The remainder of the wound is closed with a continuous catgut suture placed in two layers. Two silk sutures comprising the skin and the cellular tissue and a superficial continuous catgut suture are all that is required to bring the operation to an end.

There are many secondary details in carrying out the operation upon which surgeons are not quite agreed. Should one employ a suture that will not be absorbed (silk or worm-gut), as do Leopold, Sänger, Phillips, or silver wire, as Olshausen advocates, to insure more solidity in cases of prolapse, or a thick suture that will be absorbed, as do Terrier and Czerny? Should one of Hodge's pessaries be introduced immediately after the operation (Leopold), should the vagina be plugged when one is dealing with a retroversion (Sänger), or should the patient be kept upon a bed sloping downwards towards the head so as to diminish the intestinal pressure when one has been operating for prolapse (Phillips)?

These are merely details which I cannot discuss; it is enough for me to mention them.

Gastro-hysteropexy when performed without a previous laparotomy.—The profound terror which the peritoneum used formerly to inspire all surgeons with, caused them for a long time to dread, and still causes many of them even now to dread, making an incision into its cavity. On the other hand, the possibility of temporarily raising a retroflexed uterus so as to bring its fundus into contact with the anterior abdominal wall, caused the idea to spring up a long while ago of trying to fix its anterior surface directly without any laparotomy. According to Emmet,* it is Marion Sims who, as early as 1859, first had the idea of performing this operation. He even had a special tubular needle made for passing a silver wire through the fundus of the uterus. But having one day commenced the operation, he had not the courage to go on with it.

Caneva,† more than twenty years after, drew up a set of rules for abdominal hysteropexy (for prolapsus) performed through the serous membrane after uncovering a small portion of it. He does not seem ever to have carried out the proceeding. On the other hand, Kaltenbach‡ has on five occasions made use of this method; he uses silver wire, which he fixes loosely to the periosteum of the symphysis pubis. H. A. Kelly,§ who is still more bold, has sutured the uterus to the abdomen three times, passing two or three worm-gut or silver-wire sutures deeply through the fundus of the organ, without any preliminary incision. The sutures, which are fixed by squeezing a leaden shot upon them, are withdrawn on the fifteenth day.

This is the operation proposed by Assaky‖ in a paper read before the Society of Surgery, and which offered Roux (of Lausanne)¶ an opportunity of proving its risks by an example in his own practice; having had thoughts of performing this operation, he was seized with some scruples, just at the time of going through the peritoneum which nothing seemed to separate from the uterus, when he opened the serous membrane and

* Emmet. Trans. of the Amer. gyn. Soc., Boston, Sept., 1889 (Amer. Journ. of Obstet., Oct., 1889, p. 1069).

† Caneva. Gaz. degli Ospit., Dec. 20, 1882, No. 102, p. 810.

‡ Kaltenbach. Réunion des natur. all., Heidelberg, Sept. 3, 1889 (Centr. f. Gyn., 1889, p. 731).

§ H. A. Kelly. Amer. Journ. of Obstet., Oct., 1887, p. 1068.

‖ Assaky (of Bucarest). Bull. et Mém. de la Soc. de chir., Nov. 20, 1889. He has since performed it without mishap (La Clinica, 1890, Bucarest, No. 1).

¶ Roux (of Lausanne). Bull. et Mém. de la Soc. de chir., Dec. 4, 1889, p. 753.

found just beneath it a coil of small intestine, which was flattened out and which he had nearly pierced. This shows very clearly the dangers connected with this brilliant but blind proceeding.

Prognosis of gastro-hysteropexy.—According to the results published up to the present, the cases of death* resulting from this operation have been very rare; it is not more serious than an uncomplicated laparotomy, which really constitutes a benign operation. There is no doubt, however, that it may at times be complicated by some fairly extensive rents in the abdomen (as in one of Klotz's cases), when one has to free any firm uterine adhesions, especially adhesions connected with the rectum. It is in these cases only that it is rational to employ drainage.

Experience has proved that the bladder did not undergo any pressure in the middle line, but escaped on one side; no noteworthy, or at least no persistent troubles connected with micturition have been observed.

The cures seem to be lasting; C. Braun has seen Koeberlé's patient still cured after ten years (1879); the uterus was quite in place. Leopold† has been able to verify some of the cures after three years, and Korn‡ after sixteen months (in cases of retroversion). All the same, Sänger§ presented two of his patients before the last Congress of Gynæcology at Halle, in May, 1888, in one of whom, operated on three months before, the retroflexion had already a tendency to recur.

Gastro-hysteropexy and pregnancy.—A question which it is very important to settle otherwise than on theoretical considerations is the influence which pregnancy may have upon the position of the uterus when sutured to the abdomen. Are the adhesions destroyed? Is pregnancy hindered by the development of the uterus being interfered with, or can this latter take place freely outside and above that limited portion of the organ which remains immovable? One of the reasons for which

* The author of an analysis of Lee's work (Amer. Journ. of med. sciences, Feb., 1889, p. 216) mentions two cases of death, one immediate, the other late, resulting from gastro-hysteropexy. They do not seem to have been published. Polaillon (Bull. et Mém. Soc. de chir., 1889, p. 66) has reported one case of death; the operation had been performed for prolapse.

† Leopold. Centr. f. Gyn., 1890, No. 11, p. 186.

‡ Korn. Centr. f. Gyn., 1888, No. 1, p. 11.

§ Sänger. Verhandl. der deutsch. Ges. f. Gyn., second Congress, 1888, p. 110.

Olshausen, Sänger, &c., have practised suturing the edges and not the anterior surface of the organ, and for which also Leopold dreaded the deeply placed suture left *in situ*, seems to be precisely the fear of interfering with the development of the womb during gestation. But their method insures a less efficacious adhesion, and, moreover, the opening which Olshausen allows to remain between the uterus and the bladder is practically, in spite of all the precautions which may be taken, a button-hole which is full of danger on account of the internal strangulation it may occasion.

Besides, experience as regards this point also has upset any objections founded on theoretical grounds. It is at present well proved that pregnancy and delivery at term are not rare occurrences after hysteropexy; examples of pregnancy terminating normally have been rapidly increasing in numbers of late.

Sänger* has performed hysteropexy on two women in whom pregnancy occurred and ran a normal course. One of them aborted a first time, but becoming pregnant again, she was delivered at her full time. Olshausen † quotes a case of delivery at term in a patient operated upon by Kaltenbach. Fraipont, ‡ in reviewing six cases of hysteropexy in the practice of von Winiwarter, finds one delivery at term, one premature delivery (traumatism), and one delivery at the 8th month (living child). Jacobs (of Brussels) § has seen one of his patients operated on delivered at full term. Klotz ‖ has observed four pregnancies, four deliveries at full time. Leopold, ¶ out of 19 cases of ventrofixation for retroflexion, has found three normal pregnancies. Gottschalk ** has found pregnancy occur in one of his patients,

* M. Sänger. Ueber Pessarien, Leipzig, 1890, p. 43.—Ueber Schwangerschaft nach konservatiren Ventrofixatio uteri retroflexi (Centr. f. Gyn., 1891, No. 16, p. 306).

† Olshausen. Zeitsch. f. Geb. und Gyn., 1890, vol. 20, p. 230.

‡ F. Fraipont. Arch. de Tocol. et de Gyn., July 1891, p. 531.

§ Jacobs. Written communication to Sänger. Centr. f. Gyn., 1891, No. 44, p. 882. —Unpublished observation in R. Labusquière, on pregnancy after hysteropexy (Annal. de Gyn. et d'Obstet., Aug., 1891, p. 131).

‖ C. L. Klotz. Soc. gynécol. de Dresde, Nov. 13, 1890 (Centr. f. Gyn., 1891, p. 97), and written communicat., Dec., 1891.

¶ G. Leopold, quoted by Sperling. Zehn weitere Fälle von Ventrofixatio uteri retroflexi (Deutsche med. Woch., 1891, No. 5).—Leopold. Ventrofixatio uteri und Schwangerschaft (Centr. f. Gyn., 1891, No. 16, p. 317).

** Gottschalk. Zur Frage des Einflusses der Ventrofixatio uteri auf spätere Schwangerschaft (Centr. f. Gyn., 1891, p. 155).

abortion taking place at the third month. Flaischlen has published a case of delivery at full time occurring in the practice of Carsten.* One of the patients he operated upon is now four months pregnant, and is under observation. Lastly, Howitz† has found pregnancy occur in one of his cases, some weeks after the operation; delivery took place quite normally. With us, Routier ‡ has seen one of his patients operated on successfully delivered.

It is important to note the fact that these various cases of pregnancy and delivery which we have been enumerating have not been followed by any recurrence of the retrodeviation. There was no relapse either in the three cases of v. Winiwarter, not in fact in those of Sänger; nor was there any in Klotz's four cases of delivery, nor in those of Leopold nor that of Howitz. Six weeks after delivery, the uterus in Kaltenbach's patient was still in a state of anteversion. Jacobs exhibited a patient, perfectly cured, before the Gynæcological Society of Brussels. Routier observed that in his patient after delivery the adhesions had not been destroyed. Carsten's patient was not seen again; Flaischlen's patient had her uterus still anteflexed during the fourth month of pregnancy.

Indications for gastro-hysteropexy in cases of retroversion.—Ought one to have the same confidence as Sänger and Leopold in the total absence of danger when laparotomy is performed antiseptically, and undertake it even for cases of retroversio mobilis, that is, reducible, when the proper kind of pessary, sought for perseveringly by the physician and borne patiently by the sufferer, turns out to be without effect and that the symptoms continue? This would, it seems to me, be an error. The shortening of the round ligaments presents much too precious§ a resource to be neglected in such cases. It is true that in one of his cases (the seventh) Sänger did first of all try without success Alexander's operation. But in another case (the sixth) he decided upon performing laparotomy

* Carsten, quoted by Flaischlen. Zur ventrofixatio uteri (Zeitschr. f. Geb. u. Gyn, 1891, vol. 22, heft 1, p. 191).

† F. Howitz and L. Meyer (of Copenhagen.) Zur operativen Behandlung der Retrodeviationen des Uterus (Centr. f. Gyn., 1891, No. 48, p. 979).

‡ Routier. A case in part unpublished (Baudouin, *loc. cit.*, p. 375).

§ U. Trélat. On adherent retroversions and retroflexions (Semaine méd., July 4, 1888, p. 261).

straight away, without having previously tried to keep up the uterus by shortening the round ligaments. The same remark may be applied to Leopold's first operation. This seems to me an abuse against which one should protest. When two operations are capable of giving the same results one should only resort to the more serious one after having vainly tried the milder one (*actum minoris periculi*). One cannot, in spite of the progress made by abdominal surgery, pretend that opening the peritoneum and suturing the uterus do not expose the lives of the patients to a greater risk than does making a superficial incision and suturing the round ligaments after they have been shortened.

But although I may look upon it as an unwarrantable proceeding to perform gastro-hysteropexy at the first onset for a retroversion which is painful, mobile, and unyielding to the pessary, before having attempted Alexander's operation, I yet look upon it as legitimate when this last resource has failed. It is more rational, surer, and perhaps even less perilous than the operations for vaginal hysteropexy. It is, one must admit, preferable to the extirpation of the organ through the vagina.

Lastly, the principal indication for abdominal hysteropexy seems to me to be found in those cases of irreducible retroflexion, where the false membranes and adhesions which have not yielded under chloroform drag the fundus of the uterus back into Douglas' pouch, sometimes after a false reduction when the organ has merely got displaced by drawing upon the anterior wall of the rectum. When, during a preliminary trial under an anæsthetic, one has become convinced that reduction cannot take place by external manipulations aided by the sound or other instrument used for raising the uterus; when especially one also feels sure that the finger introduced directly into the womb, previously dilated, as recommended by Schultze, cannot affect the reduction, there are only two things to be done: either to abstain from any new attempts, which would only expose the patient to very serious accidents, connected with the appendages and the pelvic peritoneum, and to confine oneself to a palliative treatment of the symptoms as they arise, or else, if the intensity of the morbid processes demand it, to have recourse to laparotomy to liberate and then to fix the uterus.

Up till now I have only been dealing with hysteropexy performed as a principal operation, straight away, for retroversion. It is understood that one may question its desirability, but it is not so when hysteropexy is performed as a secondary, or, as one might call it, a complementary operation. When in the course of a laparotomy performed for some other lesion, such as a fibroid, an ovarian cyst, inflammation of the appendages, &c., one finds the uterus with a backward deflection, it is often sufficient to remove the appendages to bring it forwards; one should remember, in fact, that the removal of the appendages by producing a certain amount of atrophy of the uterus, diminishes and even rapidly corrects any retroflexion. Should there be however a pedicle to be made use of, it may be inserted into the abdominal wound and sutured to it. Still, I believe that it is as well not to stop there, but to pass one or two sutures under the most superficial layer of the fundus or anterior surface of the uterus in the median line so as to insure the organ being in a good position.

Another indication for laparotomy which may be the indirect cause of one's having to fix the uterus as a secondary operation, is to be found in those cases where there exist very violent pains, or very distressing reflexes connected with the appendages, whether these latter are simply prolapsed (moveable retroflexions), or whether they are covered over with adhesions (resisting and irreducible retroflexions) or are the seat of inflammation. Sänger and Leopold have in this latter case combined castration with gastro-hysteropexy. This latter is often sufficient in simple prolapse of the ovary; it then becomes an operation belonging to conservative surgery, for the reflex phenomena disappear after the fixation of the uterus, an excellent substitute in this case for Battey's operation.

Intra-abdominal shortening of the uterine ligaments.—I shall indicate very shortly some of the operations analogous to abdominal hysteropexy which are of any particular interest, although they seem to me inferior in many respects to the methods which I have already described.*

a. Intra-abdominal shortening of the utero-sacral ligaments.—

* Intra-abdominal shortening of the broad ligaments, recommended by Lawson Tait and Imlach, will not take up our time. We believe this method to be much inferior to the ordinary methods.—See for more details, M. Baudouin, Gaz. des Hôp., Dec., 1890, No. 143, p. 1325.

This method, proposed by Kelly,* consists in passing a suture on either side of the rectum into the lower part of Douglas' pouch, from within outwards, then deeply into the cervix, on a level with the lateral insertions of the utero-sacral ligament. Frommel † (of Erlangen) has practised it once with a success which was well maintained.‡

b. Intra-abdominal shortening of the round ligaments.—Gill Wylie first of all, then Ruzzi (of Bologna) and Emile Bode (of Dresden) have suggested a method of shortening by twisting each of the round ligaments.

Ruggi, § after having opened the abdomen and reduced the

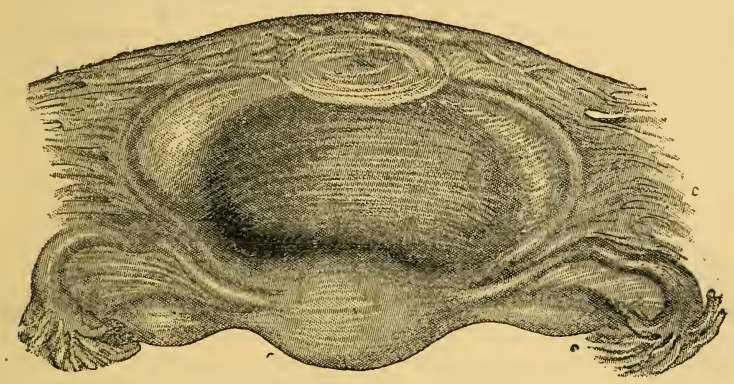


Fig. 262.—The course of the round ligaments, as seen through the peritoneum (G. Wylie).

deviation, pierces the round ligament with a curved needle holding some strong catgut, at a very short distance from its

* Kelly. Amer. Journ. of med. sciences, 1888, vol. 95, No. 5, p. 468.

† Frommel. Congress of German Gynæcologists. Friburg, 1889 (Centr. f. Gyn., 1889, No. 32, p. 567).—Ueber operative Behandlung der Retroflexio uteri (Centr. f. Gyn., 1890, No. 6, p. 94).

‡ O. E. Herrick (an operation for shortening the utero-sacral ligaments, in Amer. journ. of obstet., 1891, vol. 24, p. 314) has operated through the vagina to produce the shortening of the utero-sacral ligaments.—Sänger (Ueber Retrofixatio colli uteri retroflexi, in Centr. f. Gyn., 1891, No. 44, p. 893) has in six cases fixed the cervix to Douglas' pouch, without opening the latter. The results seemed to him to be satisfactory. At the time of his first operation, he had no knowledge of Herrick's trials in the same direction.—C. H. Stratz (Zeitschr. f. Geb. u. Gyn., 1891, vol. 21, p. 337), on the contrary, opens Douglas' pouch.

§ G. Ruggi. Sulla cura endo-abdominale de alcuni spostamenti uterini (Boll. delle Scienze med. della Soc. medico-chir., de Bologna, 1888, vol. 22, 1st and 2nd fasc., p. 30). His first operation dates from October 19, 1886.—E. Micheli. Riforma med., Rome, Jan. 8 and 9, 1889 (Anal. in Revue des Sc. méd., July, 1889, No. 67, p. 156).

entry into the inguinal canal, and on the peritoneal fold which surrounds it. He makes a firm knot on the end of the catgut which does not enter, pushes the needle into the round ligament of the same side, near its uterine end. Then by twisting the parts of the ligament through which the thread passes, he manages to approximate them. To keep the parts thus folded in contact he introduces a double continuous suture. The same manœuvre is gone through on the opposite side.

The method which Gill Wylie * has employed with success in a great number of cases is very similar. He seizes hold of the round ligaments at an equal distance from the uterine horn and the pubis, and pulls outwards through the abdominal wound; he then freshens up the internal surface of the fold, formed by raising the ligament. This freshening of the parts, which con-

Fig. 263.—Hysteropexy; G. Wylie's method.
Shortening of the round ligaments by folding them up within the peritoneum.

sists in scratching the peritoneum on the surface of the ligament, ought to insure union taking place on the level of the portion which is folded (figs. 262 and 263). For this purpose he applies three strong silk ligatures round the fold which is formed, comprising as much of the round ligament as is possible. He does the same on the other side, closes the abdominal wound, and last of all, places one of Albert Smith's pessaries in the vagina.

Bode † has a somewhat different way of applying the suture.

* W. Gill Wylie. Surgical treatment of retroversion of the uterus with adhesions, with a method of shortening the round ligaments (Amer. Journ. of Obstet., 1889, vol. 22, p. 478. This author maintains (Pittsburg med. Review, July, 1888, p. 161) that he performed his first operation in 1886.

† Emile Bode. Gynæcol. Soc. of Dresden, June 6, 1888 (Centr. f. Gyn., 1888, No. 48, p. 795). His first operation was on May 10, 1888 (Centr. f. Gyn., 1889, No. 3, p. 33).—See also ibid., 1889, No. 16, p. 285.

He takes up as much of the round ligament, starting from the uterus, as is needful for shortening to the extent he thinks necessary. Then raising the ligament, he folds it, and at the point of traction he passes a thread which almost entirely surrounds it. This thread is knotted once, and is then made to pass through the adjacent uterine horn. The two ends are easily tied together after the round ligament has been sufficiently shortened so as to be made tense.

Polk* adopts a very peculiar way of shortening the round ligaments by sewing them in front of the uterus. He freshens the round ligaments near their uterine extremity, on a level with their internal surface; he brings them in front of the fundus of the uterus and sews them on the inner side. At the top of the handle thus formed he joins them together, just where they were freshened up, with the aid of a suture of very strong thread. By the anastomosis taking the form of the letter X, behind the bladder, owing to the two round ligaments becoming glued together, he induces the formation of a fold which is internal instead of external, as in the operation of the preceding authors.

More recently, however, Dudley (of New York)† has proposed a much more complicated method than the preceding ones. He shortens the round ligaments by sewing their uterine extremity and fixing them to the anterior surface of the uterus. He adopts this plan in cases where there exist any adhesions round the uterus, without any complications connected with the appendages, and when the tubes are patent.

Vaginal hysterectomy.—Hysterectomy has been performed by various surgeons by way of treating the effects of very painful and obstinate retroflexion.‡ Such an operation would only be legitimate after the ineffectual employment of less radical measures, particularly of abdominal hysteropexy.

Choice of an operation for retroflexion.—The first indication in

* W. Polk. Observations upon the surgical treatment of retroversions and retroflexions (Trans. of the Amer. Gyn. Soc. Philad., 1889, vol. 14, p. 250). A very brief analysis of this paper was given in the Amer. Journ. of Obstet., Oct. 1889, p. 1066.

† A. Palmer Dudley. A new method of surgical treatment for certain forms of retro-displacement of the uterus, with adhesions. (Amer. Journ. of Obstet., Dec., 1890, p. 1336.)—M. Baudouin (Gaz. des Hôp., 1890, p. 1329), has proposed a slight modification of the method recommended by the gynæcologist of New York.

‡ Richelot. Union méd., 1886, p. 101.—Bouilly. Bull. et Mém. de la Soc. de chir., Oct. 24, 1888, p. 762.

every case of painful retroflexion is to look carefully for the seat of any inflammation complicating the deviation, and the greater or lesser mobility of the organ.

Can the uterus be easily reduced? The deviation is probably merely accompanied by a certain degree of metritis. Should the local examination performed bimanually confirm this fact, one should deal before all things with the inflammation of the uterus, and begin by treating the catarrhal metritis or the chronic painful metritis. The curette will have to be called into use, and amputation of the cervix by one or two flaps will be indicated in the majority of cases. I have observed several times that infra-vaginal amputation of the cervix (Simon Markwald's method and Schröder's method) was followed by spontaneous raising of the uterus, owing, no doubt, to the process of involution which succeeds, and renews the lightness and tone of the organ. The same fact has been observed by other authors,* and accounts for the cures erroneously attributed to complicated methods of excision or sutures, whose real action is not upon the deviation, but upon the metritis.

When the uterus is reducible, one should still try and ascertain whether there is any obvious affection of the appendages. One should then apply a pessary, or rather, one should raise the uterus definitely by the Alexander-Adams operation. It is only when after some months the deviation is reproduced, and the pains persist, that one will be justified in doing laparotomy,† which we will describe farther on when dealing with adherent deviations.

The shortening of the round ligaments, or the Alexander-Adams operation, being in no way a serious one, should be performed at the same sitting as the curetting, followed or not, as the case may be, by amputation of the cervix, in cases of metritis with retroflexion. By raising at the same time both the

* Triaire. Retroflexion of the uterus. Cure by excision of the cervix (Gaz. des Hôp., May 26, 1889).—Quénu. Bull. et Mém. de la Soc. chir., 1889, p. 771.

† Skene Keith (Edinb. Med. Journ., July, 1886, vol. xxxii., p. 55) has followed the plan which I have been indicating here, in the interesting report of one of the first cases of abdominal hysteropexy performed deliberately. Having been unsuccessful with the Alexander-Adams operation, he resorted to laparotomy, and fixed the pedicles of the removed ovaries into the abdominal wall. Should one find the appendages healthy, the fundus of the uterus alone has to be fixed without the ovaries and tubes being removed.

uterus and the appendages, this operation presents the formation of adhesions in Douglas' pouch, due to salpingitis.

There is also quite a class of movable retro-deviations for which this operation is essentially suitable. They are observed mostly in women of a delicate and nervous temperament, belonging to the upper classes of society. In these cases the deviation demands the most notice, the inflammation being absent or almost so. In cases of deviation, even when easily reducible, it is more the excessive mobility of the uterus which seems to cause the trouble than any abnormal position. One finds, in fact, that the uterus goes back to its defective position after reduction, and becomes bent sideways, flexed, or even anteverted. One has here to deal with a vague dislocation of the organ, so to say, analogous to certain displacements of the joints with great laxity of the ligaments, described by Gerdy. The morbid condition which results, characterised especially by nervous reflexes and neurasthenia, resembles to a certain extent those affections which F. Glénard* has described under the name of enteroptosis, although they should not be confounded with them.

In such patients, a pessary applied immediately after the uterus has been reduced by the bimanual method or by the sound, is of immense service, and one is astonished at the way in which this valuable resource has been proscribed by eminent surgeons.† At any rate, it is better to do Alexander's operation, for which it is most suitable. The patients should also be made to wear a belt to keep the abdomen fixed.

Adherent retroflexions have still to be dealt with. Here again the diagnosis of the complication seems to me of the first importance. I am not disinclined to admit with G. Wylie‡ that nine times out of ten in cases of adherent retroflexion, there exists some salpingitis which has brought about this particular kind of rolling up of the broad ligaments backwards as a consequence of the traction they undergo from the inflamed appendages. I believe it is then dangerous to make repeated

* Frantz Glénard. Neurasthenia and enteroptosis (Semaine méd., March 19, 1886, p. 211).

† F. Terrier. Bull. et Mém. Soc. de chir., April 3, 1889, p. 277 : "I have carefully avoided recommending pessaries, for which I have an instinctive horror."—Bouilly (ibid., p. 293) has quite justly raised his voice against this radical opinion, which I have myself tried to combat (ibid., p. 295).

‡ G. Wylie, *loc. cit.*, p. 482.

attempts at reduction, either with the finger introduced into the dilated organ, or with sounds or other instruments. I know of several cases of serious mishaps occurring after such manipulations, which were the cause of the return and the exacerbation of the inflammation of the appendages; some only of them were published.* Should reduction not be obtained after one series of moderate attempts under chloroform, I give it up. Should the metritis be the principal factor in the case, one should be content with treating it surgically (curetting or amputation of the cervix) in the hope of seeing the pains disappear at the same time as the inflammation. Should the metritis not be very pronounced, and should one obviously merely have to deal with a lesion of the appendages, which is either ancient or persistent, laparotomy should be performed. This should also be done if, in the absence of any obvious lesion of the appendages, there are persistent pains connected with the deviation to remedy which the shortening of the round ligaments should not be attempted. In fact, Trélat has rightly pointed out how useless it was in such a case to attempt Alexander's operation.

When laparotomy, which is always in such a case to a certain extent exploratory, shows any lesion of the appendages in the process of evolution (pyo-salpinx, parenchymatous salpingitis, ovaritis, sclero-cystic degeneration of the ovary, &c.), one has to remove the diseased organs. One frequently sees, after double castration and destruction of the adhesions, the uterus rise spontaneously;† one might then, if need be, do without the hysteropexy, in fact there is nothing left to draw the organ backwards, and the atrophy which occurs will be sufficient to keep it straight.‡ But should there be any tendency for it to fall back again, the uterus should be sutured to the abdominal wall.

Lastly, there are cases which are complicated in other ways, in which the retroversion of the uterus coincides with a certain degree of descent of the pelvic floor, and of the means by which the uterus is fixed. The women are generally multiparæ, and it appears as if the retroflexion were the first stage of prolapsus,

* P. Delbet. Bull. de la Soc. anat., 1888, p. 980.—Picqué. Bull. et Mém. Soc. de chir., 1889, p. 937.

† Routier. Bull. et Mém. Soc. de chir., Jan. 16, 1889, p. 39.

‡ Olshausen. Soc. obst. et. gyn. de Berlin, Nov. 8, 1888 (Centr. f. Gyn., 1889, No. 49, p. 850).

shown by the relaxation of the vagina and the gaping of the vulva. One has then successively to attack each of the morbid elements by combined operations*; the metritis, by employing the curette and amputating the cervix; the weakness of the perineum by colpo-perineorrhaphy; the deviation of the uterus by the shortening of the round ligaments if the uterus is mobile, and by abdominal hysteropexy if the organ is adherent. One should only perform plastic operations on the vagina and the peritoneum after having first of all fixed the uterus so as to be better able to judge to what extent the parts should be freshened up.

* The necessity for combined operations in cases of this kind has been very clearly shown by Doléris, Gaz. méd. de Paris, April, 1886.—Nouv. Arch. d'obstet. et de gyn., 1886, p. 350.—Paper read before the Soc. de méd. de Paris in Union méd., June 11, 1887.—Mémoire à la Soc. gyn. amer. in Trans. of the Amer. gyn. Soc., 1887, p. 488 (these last two cases have been reproduced in the Nouv. Arch. d'obst. et de gyn., 1890, pp. 34, 49, 97, 177, 257, and 329).

Mundé (The value of Alexander's operation, in Amer. Journ. of Obstet., 1888, vol. 21, pp. 1132 and 1136), who for a long time has been also performing combined operations, observes that to perform a plastic operation on the vagina and the perineum, and then proceed to shortening the ligaments (like Doléris), is to "put the cart before the horse."

CHAPTER III.

PROLAPSE OF THE GENITAL ORGANS.*

Definition.—Etiology.—Morbid anatomy: 1, procidentia of the vagina only. 2, Simultaneous procidentia of the vagina and the uterus, with elongation of the cervix. 3, Procidentia of the vagina and the uterus resulting from primary hypertrophy of the cervix. 4, Procidentia of the uterus and the vagina without hypertrophy of the cervix.—Symptoms.—Progress. Prognosis.—Diagnosis from: polypus; inversion; urethrocele.—Treatment. Belts. Pessaries. Hysterophores.—Surgical treatment. Preliminary operations. I. Establishment of an inferior point of support. Colpo-perineorrhaphy. Hegar's method. Perineauxesis. A. Martin's method. Methods of Bischoff, of Winckel. Colpo-perineoplasty by the sliding method; Dolé'ris' method. Anterior elytrorrhaphy: method of Stoltz. L. Le Fort's method of forming vaginal septum. Treatment after colpo-perineorrhaphy. Gravity. Immediate and ulterior results of colpo-perineorrhaphy. II. Raising of the uterus by shortening the round ligaments. III. Suturing of the uterus to the abdominal wall: gastro-hysteropexy. IV. Vaginal hysterectomy. Choice of the operation.

Following Trélat's example,† I have placed under the same heading, the lowering of the uterus (prolapsus, descent, dropping, precipitation), that of the anterior wall of the vagina, which drags down the bladder (cystocele), and that of the posterior wall which generally follows the rectum (rectocele). These various displacements, which have been artificially separated are closely

* I think it useless to devote a special chapter to other less important displacements of the uterus. I shall merely mention them.

The uterus may be brought directly forwards, ante-position, when it is pushed by any tumour which has grown behind it. A striking clinical example of this displacement is presented by a retro-uterine hæmatocele; the change of position is never anything more than an additional symptom.

By retro-position is meant the carrying back of the entire uterus, without deviation of its axis. One sees it come on after posterior parametritis or perimetritis. It may, in exceptional cases, be observed in a complete state. But there is soon added a forward flexion of the body of the uterus (fig. 225). The symptoms observed are due to the inflammatory adhesions, and the treatment should be directed to them entirely.

The raising of the uterus is not a disease either, but merely a symptom. A tumour seated in Douglas' pouch, between the ligaments or in the pelvis, may thus raise the uterus. Sometimes it is thus kept, as it were, suspended by adhesions which have taken place during pregnancy, and have prevented it from afterwards regaining its normal position. In all these cases one generally meets with a certain elongation of the cervix.

† U. Trélat. Lectures on prolapse of the female genital organs (Annal. de gyn., May, 1888, vol. 29, p. 321).

united; although isolated cases may exist, they are only exceptions; most often they occur in succession. Lastly, in the etiology and the treatment are to be found other bonds of unity in these various lesions, constituting a real clinical unity. The hypertrophy and elongation of the uterus should also be added, both on account of their anatomy and their symptoms, if one wishes to have a complete picture.

Etiology.—Hart* has judiciously compared these displacements to hernias, in general. But there is this difference, that in ordinary hernias the organs pushed outwards by the intra-abdominal pressure are essentially mobile (intestine, epiploon), whereas here one is dealing with fixed organs, which are forced to preserve certain points unmoved on a level with their deep attachments, so that they are obliged to undergo certain modifications in shape. Herein essentially is to be found the key to all hypertrophies of the cervix uteri.

All the same, just as in the case of hernia one can distinguish those cases of prolapsus of the genital organs which are due to force from those which are due to weakness. The first result from some violent effort occurring either in the first instance or acting as the predisposing cause, and so to say, paving the way. A fall upon the seat, a fit of epilepsy, a violent fit of coughing, have been the cause of what certain authors have called acute prolapsus, even in virgins†; but most often, one or several former pregnancies have weakened the means of support of the uterus when some effort brings about its fall.

One has often observed the same thing during pregnancy,‡ in the same circumstances. One can readily conceive, in fact, that the great changes which have taken place in the connections of the gravid uterus facilitate a prolapse considerably. All the ligaments are more voluminous, but they are also softened; the

* Hart. The structural anatomy of the female pelvic floor. Edinburgh, 1880.

† R. Barnes. Clinical treatise on diseases of women. French transl. Paris, 1876, p. 540.—Mundé. Forcible and complete prolapse of the uterus in a virgin (Amer. Journ. of Obstet., 1888, vol. 21, p. 70).

‡ Dutauzin. Etiology and symptoms of prolapse of the uterus. Thesis for M.D., Paris, 1887.—Gorodichre. On prolapse of the gravid uterus. Thesis for M.D., Paris, 1888.—Faivre. Contrib. to the study of prolapse of the gravid uterus. Thesis for M.D., Paris, 1890.—A. Berne (Report of a case of complete prolapse of the uterus during pregnancy, Lyons, 1891) has seen this mishap at five and a half months of pregnancy. The labour took place at term, and the patient was cured of her prolapse.

intra-abdominal pressure is increased, and acts with greater force upon the weak points of the pelvic floor, where the opening of vagina forms a sort of line of cleavage always ready to cede to any effort.

Rupture of the perineum is amongst the non-doubtful predisposing causes, in spite of what certain authors have said.* It allows, in fact, the vulva to be in a gaping state, so that the air has access to the vagina, the walls being separated and the resistance of the perineal floor being, so to say, divided into two. It has even been suggested † that the transversus perinei and the levator ani might have been torn subcutaneously, or later on

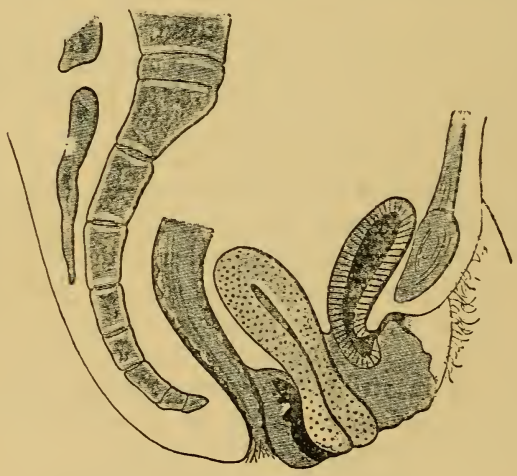


Fig. 264.—Prolapse of the genital organs.

Procidentia of the anterior wall of the much thickened vagina; slight cystocele; persistence of the posterior cul-de-sac of the vagina; hypertrophy of the middle portion of the cervix.

have become paralysed owing to the harm done during the puerperium, without any apparent injury of the integument.

Lastly, the laxity of the peritoneum, which has become distended by the ascent of the gravid uterus, no doubt plays a part in the predisposition to prolapsus which is brought about by parturition.

Ought one also to admit that there is an hereditary congenital

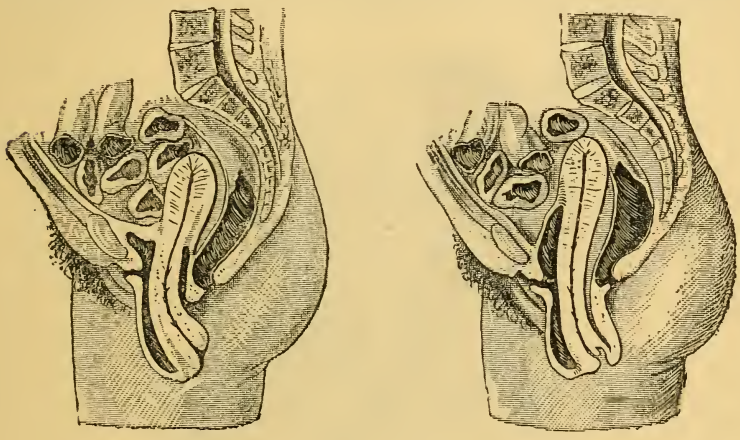
* B. Hart and F. Barbour. Manual of gynæcology. French transl. Paris, 1886, p. 610.

† B.-E. Hadra (San Antonio). Amer. Journ. of Obstet., April, 1884, p. 365.—U. Trélat. Prolapsus of the genital organs (Annal. of gynæcol., Sept., 1888, p. 174).

predisposition * or merely a particular individual predisposition, resulting from the weakness of the means of fixation belonging to the genital organs ? † This latter fact, to say the least, is very likely, and explains how the efforts which would be without effect in the majority of women exert an action upon certain others. It is besides what one observes in cases of hernia.

Morbid anatomy.—It is absolutely necessary to clearly distinguish certain categories.

1. *Procidentia of the vagina alone (cystocele and rectocele).*—In the great majority of cases the prolapse of the vagina precedes



A B

Fig. 265.—Prolapse of the genital organs.

A. Procidentia of the anterior wall of the vagina, with cystocele and hypertrophic elongation of the middle portion of the cervix (Schröder); the posterior cul-de-sac of the vagina is preserved.—B. Complete procidentia of the vagina, with cystocele and without rectocele. Hypertrophic elongation of the supra-vaginal portion of the cervix; the posterior cul-de-sac of the vagina is inverted.

the fall of the uterus and brings it about sooner or later like some secondary symptom.

The anterior wall of the vagina is the one which descends most easily; it is even usual to observe in women who have had many children a very slight degree of cystocele when the bladder is full, and without its constituting a truly morbid condition, the anterior wall of the vagina simply reaches beyond the posterior

* A. Doran. Trans. of the Obstet. Soc. of London, 1884, p. 88.
† U. Trélat. *Loc. cit.*, p. 328.

one, and this causes no inconvenience if the perineum has sufficiently kept its tone. The contrary state of things may however happen; a sort of hernia of the bladder tends to occur through the vulva, for the urinary reservoir, tightly fixed to the vagina by its posterior wall, cannot get separated from it; but at times this hernia of the bladder is more apparent than real, on account of the considerable thickening of the vaginal wall which covers it and increases its external prominence (figs. 264 and 265).

The posterior wall of the vagina is not long in following this movement of descent; the dilatation caused by the rectum finds

Fig. 266.—Prolapse of the genital organs. Complete procidentia of the thickened vagina; slight cystocele; disappearance of the posterior cul-de-sac of the vagina; hypertrophy of the supra-vaginal portion of the cervix.

its way into the vaginal fold, but the laxity of the bonds existing between the intestine and the posterior wall of the vagina prevents the rectum from being dragged down straight away; a rectocele is therefore much more frequent than a cystocele. When they both exist, a finger introduced into the anus can be hooked back into the posterior part of the tumour which protrudes from the vulva, whereas a catheter equally curved can have its point pushed into the anterior segment. One has then to deal with a bilobed prominence, which is as a rule unequally developed forwards and backwards, which increases and becomes distended under the influence of any

efforts and with a surface still presenting some remains of the rugæ and the colour of the vagina; but exposure to air and friction very soon alter this surface, rendering it thicker and harder, and at times ulcerated.

Should the bladder (which occurs very rarely indeed) or the rectum (which occurs much less rarely) not have been drawn down by the walls of the vagina, it is the peritoneum which pushes itself backwards and forwards, dipping down in an inordinate manner into the vesico-uterine cul-de-sac and Douglas' pouch. This presupposes that the uterus is very firmly fixed and that the serous membrane is very flaccid, or

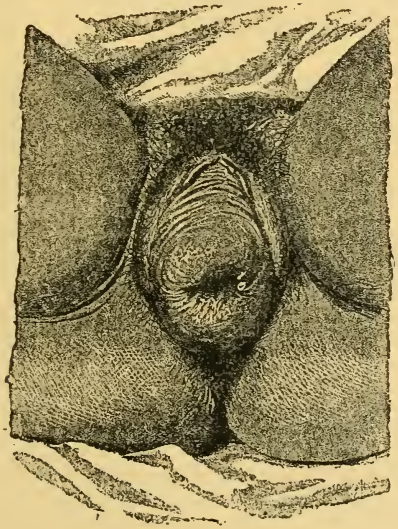


Fig. 267.—Prolapse of the uterus; considerable hypertrophic elongation of the cervix; cystocele.

else, according to Freund, that the fœtal state is subsisting, for in the fœtus the folds of the peritoneum descend relatively much further. It is then possible for the small intestine to insinuate itself either forwards or backwards, depressing the walls of the vagina and forming what has been named a vaginal hernia or enterocele.

As a matter of fact, one should look upon these lesions as very rare forms of prolapse of the vagina. There have been very few cases published of vaginal prolapse with anterior

enterocele,* whereas one much more frequently meets with vaginal prolapse with posterior enterocele. †

2. *Simultaneous vaginal procidentia and uterine prolapsus, with secondary hypertrophic elongation of the sub-vaginal portion of the cervix.*—The traction exerted by the prolapsed vagina upon the ligaments connecting it with the cervix uteri very soon begins to influence it. Generally these ligaments become loosened little by little, and give way from above downwards, so that the os tincæ disappears, owing to the culs-de-sac becoming effaced. The vagina continuing to exert traction, and the uterus still being fixed above, the cervix, which has become entirely sub-vaginal, undergoes a progressive elongation. Sometimes there is lengthening, and a sort of stretching without

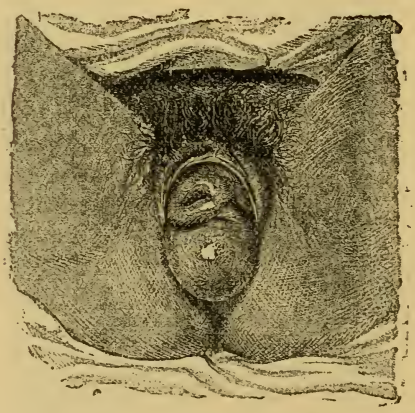


Fig. 268.—Prolapse of the uterus; hypertrophic elongation of the cervix; rectocele.

hypertrophy. Most often the passive congestion and the inflammation occurring in the prolapsed organs produce a hypertrophic thickening of the elongated cervix. But this hypertrophy is secondary and not primary. The mark and the proof of this process is found in the preliminary disappearance of the os tincæ, owing to absorption under the efforts of traction.

In the centre of the tumour formed by the retroverted vagina one can then feel a cylindrical column formed by the lengthened and thickened cervix.

* Breisky. Krankh. der Vagina, 1886, p. 69.—Etheridge. Journ. of Amer. med Assoc., Feb. 5, 1887 (Anal. in Centr. f. Gyn., 1887, No. 33, p. 535).

† A. Martin. Path. und Ther. der Frauenkrankh., 1887, p. 121.

If, as frequently happens, the posterior wall of the vagina has given way later and less completely than the anterior wall, the vaginal procidentia only takes place forwards; the cavity of the vagina is still extant in the posterior part. At the same time

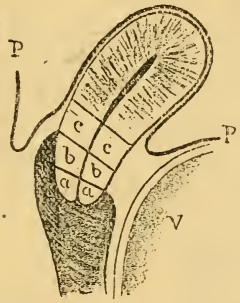


Fig. 269.—Division of the cervix into three parts (Schröder).

P, peritoneum; V, bladder; *a*, sub-vaginal portion; *b*, middle portion (sub-vaginal behind, supra-vaginal in front); *c*, supra-vaginal portion.

posteriorly one finds that the cervix has taken part in the general hypertrophy, which can be ascertained on introducing a finger into the still existing posterior cul-de-sac (figs. 264 and 265, A). This curious arrangement, which is easily explained

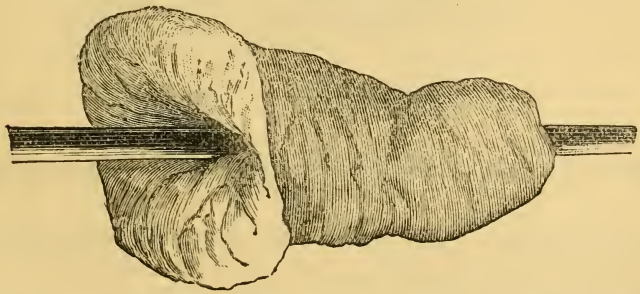


Fig. 270.—Conoidal amputation of the cervix uteri (Huguier's method). Portion of the cervix thus removed (it has a sound passed through it). Natural size.

by the above remarks, has given rise to a much more complicated explanation on the part of Schröder. He attributes it to the primary hypertrophy of the middle portion of the cervix, sub-vaginal or free posteriorly, and supra-vaginal anteriorly (fig. 269, *b b*).

3. *Procidentia of the vagina and uterus resulting from primary*

hypertrophic elongation of the supra-vaginal portion of the cervix. —Cases of this kind, long unrecognised, which Huguier believed to be much more frequent than they really are, and the existence of which certain authors are inclined to-day to dispute (Virchow), cannot remain in doubt. In fact, one may observe, in certain virgins, in whom the vagina and perineum are perfectly resistant, with no signs of the body of the uterus coming down, an inversion of the upper portion of the vagina co-existing with hypertrophy of the cervix, often involving both the sub-vaginal (os tincæ) and the deeper or supra-vaginal portion.* I have operated on a case of this sort in the wards of my lamented

Fig. 271.—Primary prolapsus of the uterus, without hypertrophy of the cervix, following retroversion.

teacher, Gallard. One cannot then help admitting that it is owing to this primary elongation of the cervix that the ligaments of the vagina have been dragged downwards. Besides, later on, the parts may be reversed, and the vaginal procidentia becomes the more important factor, and in its turn elongates the cervix. All the same, the starting-point has been in an opposite direction. I believe that in order to determine it great importance should be attached to the complete preservation of the whole length of the os tincæ, often found in a state of hyper-

* Legar and Kaltenbach, *loc. cit.*, French transl., p. 559.

trophy. It is a sure proof of the absence of traction at this level upon the insertions of the vagina.

The effect of hypertrophy of the cervix in cases of prolapsus of the genital organs.—It may be useful, just in passing, to say a few words about hypertrophy of the cervix, and see what part it takes in cases of prolapsus of the genital organs.

Hypertrophy and elongation of the cervix, above the attachments of the vagina, had been observed and individually studied by a few authors, but none of them had thought of giving it very great importance, until Huguier published his celebrated memoir.* He displayed great skill in demonstrating, by the help of clinical facts and pathological specimens, that in by far

Fig. 272.—Prolapse of the uterus with anteflexion; the uterus has lost its connections with the bladder and rectum, which have now got into contact with one another just above it.

the majority of cases prolapse of the uterus has been misunderstood. There is, he says, no lowering, precipitation, or prolapse of the womb, which is expelled wholly from the abdomen, through the vulvar orifice, after the fashion of a hernia, but a primary elongation of the supra-vaginal portion of the cervix, which having become hypertrophied and being unable to expand towards the abdomen, forms a prominence through the opening of the vagina, dragging with it the vagina and the neighbouring viscera, which are more or less intimately adhering to it. Thus

* Huguier. Memoir on hypertrophic elongation of the cervix uteri. Paris, 1860, Mem. of the Acad. of Med., 1859, vol. 23, p. 279.

Huguier brought on quite a revolution in the ideas which up to that time were admitted. Before him, prolapse of the uterus meant the last degree of that dropping of which three degrees were admitted. 1. Simple lowering. 2. Descent, when the cervix presents between the labia. 3. Dropping or precipitation, when the body has followed the neck and hangs entirely out of the vulva.* According to Huguier, cases of this order, without any preliminary hypertrophy of the cervix, would be great exceptions. In the great majority, hypertrophy of the supra-

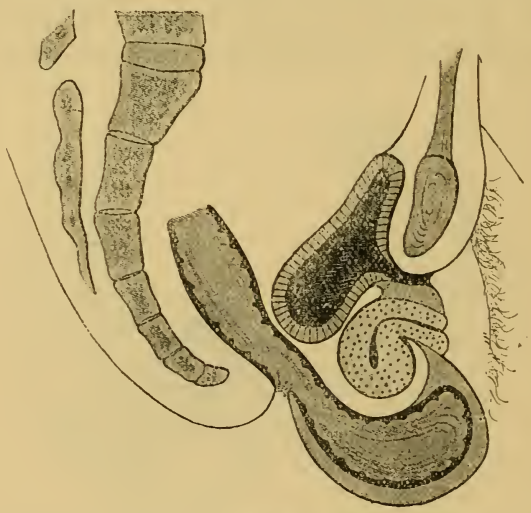


Fig. 273.—Prolapsus uteri with retroflexion; rectocele.

vaginal portion of the cervix would be the initial lesion, producing the real displacement of the vagina and the apparent displacement of the uterus. This is what characterises the disease, and what should be dealt with in the treatment. Huguier's treatment consisted in conoidal amputation of the cervix; the latter was first of all dissected out between the bladder and the rectum, and then resected as high up as possible † (fig. 270).

* Courty. Practical treatise on the diseases of the uterus, 1881, p. 589.

† I have several times performed this operation, and I have been convinced that it is a most valuable step to begin by; but, performed according to Huguier's method, without bringing the mucous membranes into apposition by a suture, it is liable to cause shrinking, which, although of no great importance in old women, yet causes serious inconvenience to women who still menstruate.

If one tries to give full justice to the work presented to us by Huguier, one sees that without having the wide range which he has given it, and which others afterwards, such as Gallard,* have attributed to it, it is all the same of great importance. From a pathological point of view, he has proved the extreme frequency of supra-vaginal hypertrophic elongation of the cervix in prolapsus of the genital organs. This hypertrophy, it is true, is not always, contrary to his opinion, the primordial part; it is most often a secondary elongation, due to the traction exercised by the prolapsed vagina, and the hypertrophy is itself merely a sequel to the hæmorrhagic stasis, favouring the production of parenchymatous cervical metritis. But the fact subsists; it had been unrecognised, and Huguier deserves the credit of having brought it prominently to light. He also deserves that of including amputation of the hypertrophied cervix in the treatment. It is a fact that he was wrong in looking upon it as sufficient; but when one remembers the almost constant want of success attending plastic operations before the days of antiseptics, one will admit that some excuse is due to Huguier for being discouraged by them, as were nearly all his contemporaries. All the same, amputation of the cervix has remained the initial step in the operations performed for the treatment of most cases of prolapsus.

What is the nature of hypertrophy of the cervix? When it follows upon prolonged traction of the prolapsed vagina, and the resulting elongation, one cannot help recognising an inflammatory process. But when the hypertrophy occurs in the first instance, primarily, whence does it come? Is it the result of some congenital predisposition of the order of malformations, a predisposition which would only have any effect when the organ becomes completely developed, induced by the appearance of puberty, or after the superactive nutrition accompanying pregnancy? Is it even then the sign of some parenchymatous metritis localised in the cervix, as Gallard is inclined to think? It is possible that both these factors act alternately or simultaneously. No very instructive results have been obtained from examination with the microscope † after amputation of the

* Gallard. Clinical lectures on the diseases of women, 1879, p. 783.

† Olivier has given a summary of the results obtained by examining with the microscope the cases in which I had removed the cervix by Huguier's method, in

cervix; something similar to the structure of an inflamed uterus was found. Sufficient distinction has not been made between specimens coming from hypertrophy secondary to elongation, and those where the hypertrophy is the initial phenomenon. The inflammatory lesions might also frequently have been not primary but secondary, for any uterus which descends is almost fatally subjected to external infection, which sets up catarrhal endometritis.

4. *Procidentia of the uterus and vagina, without hypertrophy of the cervix.*—One frequently finds a certain degree of lowering, so that the cervix is more easily reached by the finger, whilst the vaginal culs-de-sac become deeper. But the complete and sudden dropping of the uterus is of rare occurrence. In fact, the amount of resistance to overcome is considerable.* Such would be a true case of hernia from violence, requiring some great effort. Here it is generally the uterus which drags down the vagina after it; it is almost indispensable for some effort so to act upon the uterus as to drag it down towards the vulva, that the organ itself should be retroverted (fig. 271).

When the uterus has passed beyond the vulva, it may, inside the sort of hernial sack in which it is contained, undergo certain deviations on its axis, and become anteflexed (fig. 272) or retroflexed (fig. 273).

Lastly, inversion has been observed combined with prolapsus.

The relations of the neighbouring organs change according to the variations and the degrees; in a general way, the more the cervix is hypertrophied (and by the cervix it is always necessary to understand the supra-vaginal or deeper part and not the os tincæ), the more distant become the folds of the peritoneum

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Gallard's wards. He found no hypertrophy, but some localised sclerosis of the arteries. Olivier, in Emmet. Treatise on diseases of women, French translation, p. 496, and Note on a case of hypertrophic elongation (Annal. de gyn., Sept., 1881, vol. 16, p. 202).

* Bastien and Legendre (Bull. de la Soc. de chir., April 13, 1859, vol. 9, p. 417) have surely given too much importance to this resistance. They say that on the dead body it is necessary to exert a traction of 15 to 20 kilogrammes in order to bring the cervix down to the vulva, and of 50 kilogrammes to get it beyond the orifice. Clinical experience shows daily that these results can be momentarily obtained in most women, without any real violence; but the lowering thus obtained disappears of itself as soon as traction ceases, owing to the elasticity of the tissues. What constitutes the morbid state is the persistent lowering resulting from the elasticity of the parts being exhausted.

from the os uteri; they are found, therefore, very near it in the variety which I am now dealing with (fig. 271).

When there exists a very well-formed rectocele (fig. 273), the fæces may accumulate and become hardened in the cul-de-sac which pushes the vagina down.

A cystocele very soon causes the bladder to acquire the form of a wallet, the lower pouch of which, situated beneath the internal orifice of the urethra, allows the urine to stagnate (figs. 265 and 271); so there is often some dilatation of the bladder, of the ureters, of the calices, owing to the irritation or the compression of the lower ends of the ureters.* The presence of calculi has been detected in a cystocele, but the cases have not been as numerous as one might have been led to believe *a priori*.†

One should observe the thickening of the mucous membrane of the vagina, which sometimes acquires the consistence of the skin or of leather, its whitened or violet appearance, occasionally the œdema of the prolapsed parts, and lastly the ulceration or ectropion of the orifice of the cervix, or any scratches or ulcers due to friction of the surface of the tumour.

The immense majority of prolapsed uteri are affected with metritis. Chronic salpingitis is also rather frequent.

Symptoms.—Acute prolapsus, as it has been called, or that which occurs suddenly during a violent effort, like a hernia, is rare, but it has been observed. There is then to be seen hanging out of the vulva, immediately after the violence which has caused it, a tumour, formed either by the anterior wall of the vagina alone, or also by the uterus itself. There is intense pain, and occasionally syncope and peritonitis are also present as symptoms.

But generally the parts come down gradually, and give rise only to vague and ill-defined functional symptoms: feeling of weight in the perineum, dragging pain in the loins and lower abdomen, fatigue on walking, accompanied by the other general signs of metritis, to which are very shortly added micturition troubles, dysuria, incontinence, retention, with or without cystitis. When the cystocele is very pronounced, the patient, to facilitate

* Feré. Note on the lesions of the urinary organs secondary to prolapse of the uterus (Progrès. méd., 1884, p. 22).

† Varnier. On vaginal cystoceles complicated with calculi, with or without prolapse of the uterus. Paris, 1886.

micturition, presses directly upon the urinary reservoir, forming an external hernia.

Menstruation is not disturbed in any particular way. Fecundation is difficult in complete prolapsus, although it is possible. Abortion may take place, but the gravid uterus may also increase normally in the abdomen, causing the signs of prolapsus to momentarily disappear.*

It is very important to observe that here, as in the case of hernia, it is not the most marked lesions or the most apparent displacements which give rise to the most painful symptoms. One may see women coming to the hospital who have the uterus hanging between their legs, and who have continued to apply themselves to their laborious tasks up to the time when some accident forced them to put themselves under treatment. On the other hand, some women who have but a slight prolapse, leaving the uterus still at a distance from the vulvar orifice, suffer most acute pain on walking, and are reduced to impotence. It seems as if in the first case a sort of new and definite uterine force had become developed, allowing a considerable lesion to be easily tolerated, whereas in the other case this sort of compensation had not taken place; the unstable state of the uterus then gives rise to incessant pains, to nervous reflexes, which render metroptosis one of the special cases of enteroptosis, that morbid condition so clearly described by F. Glénard.†

The physical signs are characteristic.‡ When the prolapse is in its first stage, the mucous membrane of the vagina, although flabby and ready to protrude through the vulva, does not pass beyond it during any efforts. One can then, if the patient is placed in the dorso-sacral position and made to bear down, see the anterior wall come out with a sort of rotatory movement, causing a soft pink tumour to protrude from the vagina, which disappears when the effort ceases.

* A. Berne, *loc. cit.*

† P. de Lostalot-Bachoué. On affections of the viscera secondary to dropping of the pelvic floor in women. Thesis for M.D., Paris, 1889.

‡ Gosselin (Clin. chir., Paris, 1873, vol. 2, p. 534), struck by the importance belonging to this protrusion of the mucous membrane through the vulva in producing the symptoms, made this peculiarity the basis of his division, and distinguished: 1, incomplete descent without accompanying prolapse of the recto-vaginal and vesico-vaginal partitions; 2, incomplete descent, but with one or the other of these forms of vaginal prolapse; 3, complete prolapse (precipitation) differing from the preceding in that the cervix has passed beyond the vulva, and presents externally.

It is important to remember that the anterior and posterior walls of the vagina are in the normal state flattened out and applied one against the other in such a manner that a section through the canal in a state of rest gives a fair representation of the letter H. One must not expect the procidentia of the vagina to take place in the shape of a cylinder, involving the whole circumference of the canal, as is the case with the rectum. The anterior wall and the posterior wall are the only parts which protrude, either separately or simultaneously, sliding one upon the other, or remaining in juxtaposition. This first degree of cystocele, which is, so to say, intermittent in its appearance, is succeeded by a permanent cystocele; then, later on, behind the vaginal tumour, the os tincæ appears, from which there is the mucous oozing due to cervical catarrh. If the posterior wall of the vagina is also dragged down, this orifice is found in the centre, and at the summit of the piriform tumour, which separates the labia minora. The surface is dry, rough, tanned from exposure to the air, and at times, besides the ulceration round the os uteri, there is some loss of substance, caused by the friction and the want of cleanliness. The base of the tumour is surrounded by a more or less deep furrow, especially on the side of the fourchette. It varies from the size of an egg to that of the two fists (figs. 267 and 268).

A different sensation will be communicated by palpation, according to whether the uterus takes part or not in the prolapsus. All the part belonging to the prolapsed vagina is flabby. The tension and elasticity of the cystocele increase when the bladder becomes full; should there exist, as rarely happens, an enterocele, one can detect gurgling. In cases of prolapse of the uterus without cervical hypertrophy, the body of the uterus is to be felt by palpation in the interior of the tumour (figs. 271, 272, and 273). But in the typical cases of prolapse with secondary or primary hypertrophy of the cervix which I have described, it is only this segment of the womb which is found to exist in the centre of the tumour (figs. 264, 265, and 266). It forms the axis, more or less thick and rigid according to the case, conveying to the finger, which passes round and palpates the tumour, the sensation sometimes of a cord, sometimes of an elastic and resisting cylinder. By bimanual palpation, one can feel that it is con-

tinuous with the body of the uterus, which is still behind the pubes.

The sound will give one pathognomonic signs in cases of prolongation of the cervix; the hysterometer enters to a great depth, from 10 to 20 centimetres. One should, however, remember that in old women the cervical canal may be obliterated.

The reducibility of the tumour is complete in cases where the uterus does not take part in the prolapse; it may also be possible in the latter case, but then it can only be maintained with difficulty. Lastly, a permanent reduction is almost always quite impossible; that kind of firm column which takes place in cases of hypertrophy of the cervix, in the middle of the tumour, could only be pushed back by resorting to an amount of violence which might be dangerous.

The exact arrangement of the bladder can be ascertained by a male sound, which should be introduced with the point downwards; the urinary reservoir often reaches to the immediate neighbourhood of the os uteri (cases of secondary elongation of the cervix from traction (fig. 265); at other times the os tincæ, when it remains intact, produces just above the extreme limit of the bladder a prominence which may even be exaggerated (cases of primary hypertrophic elongation of the cervix uteri in its supra-vaginal portion (fig. 266).

Course, prognosis.—The course of the disease is essentially chronic, and, if left to itself, the prolapsus becomes more and more complete. There are patients in whom this descent of the genital organs exists with other very bulky herniæ, constituting a sort of pelvic eventration quite as incurable as the abdominal variety.

Some spontaneous cures* have been spoken of following peritonitis, when the uterus has become fixed by the formation of false membranes during some temporary reduction; these cases seem to me to require confirmation.

Diagnosis.—Bimanual palpation, rectal tactus, uterine and vesical catheterisation, will enable one first of all to distinguish a tumour protruding from the vulva, from a polypus, or an inversion of the uterus.

As a matter of fact, this is not the most difficult part of the

* Fritsch. Die Krank. der Frauen, 1886, p. 276.

diagnosis; it consists entirely in precisely determining the parts which have come down, and the alterations in situation, shape, and volume which they have undergone. A male sound passed round the interior of the bladder will clearly indicate its limits; the hooked finger introduced into the rectum will be able to follow its bend forwards. The presence of a rigid axis in the middle of the tumour, which is to be detected by palpation, and the depth of the uterine cavity as ascertained by the sound, will indicate if there is any hypertrophy of the cervix. It is impossible to ascertain the condition of the peritoneal culs-de-sac, except when any gurgling, produced by attempts at reduction, makes one suppose that there must be some coils of intestine behind or even in front of the prolapsed uterus. These enteroceles, which are exceedingly rare, as I have said, are not often to be found when there is supra-vaginal hypertrophy of the cervix; in this case, the peritoneum is farther from the vagina than in the normal state. In simple prolapse, without cervical

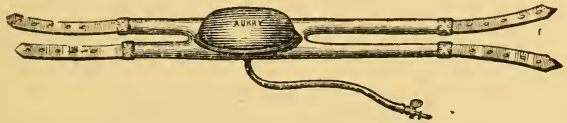

Fig. 274.—Air-pad for the perineum.

hypertrophy, the peritoneum is, on the contrary, much nearer (fig. 271).

An interesting variety of vaginal prolapsus, which may almost be looked upon as a special kind of cystocele, is urethrocele, about which Professor Duplay* has published an important work. The tumour is formed by the dilatation of the urethra, or by some cavity communicating with this canal, the bladder possibly remaining unaffected. This affection is characterised by the presence at the vulva of a tumour which, as a rule, does not exceed the size of a walnut, situated immediately below the urethral canal, and seeming to be a continuation of the meatus; it becomes more prominent during any efforts. It is only to be

* S. Duplay. Contribution to the study of diseases of the urethra in woman (Arch. gén. de méd., July, 1880, series 7, vol. 5, p. 12.—Piedpremier. On urethrocele. Thesis for M.D., Paris, 1887.—Th. A. Emmet. The cause and treatment of urethrocele (New York med. Journ., Oct. 27, 1888, p. 449).—De Témoin. Contribution to the study of genital prolapsus. Thesis for M.D., Paris, 1889.

distinguished from a cystocele by careful examination, and also by observing that it is well defined above, and is not continuous with the bladder, which has no tendency to become prolapsed. With a catheter, one can also penetrate first of all into the pouch of the urethrocele and then into the bladder, following a much longer tract along the lower wall of the

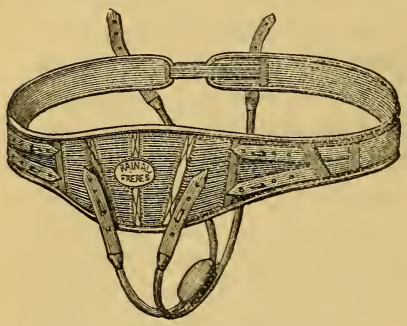

Fig. 275.—Belt with perineal pad.

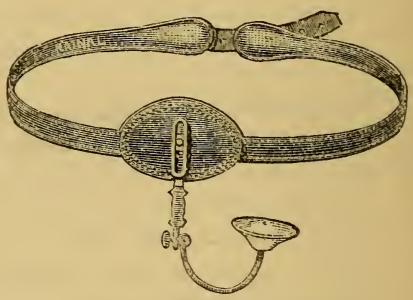

Fig. 276.—Hysterophora with cup.

urethra, which is bent inwards, than by following the upper wall, which remains straight. The urethro-vaginal partition is at times thickened, or, on the contrary, thinner.

By continuing to dilate, is it possible for the urethrocele to get beyond the neck of the bladder, and then to be transformed into a cystocele? This is very doubtful.

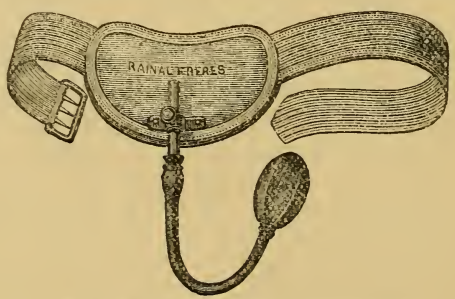

Fig. 277.—Roser-Scanzoni hysterophora.

Treatment.—Cases of genital prolapsus require a rational treatment, which must be seen to during confinement and the subsequent period.

The relief afforded here by belts and pessaries is only precarious, and often quite illusory. One should not, however,

neglect to have the belly supported by an abdominal belt, which should be well-fitting, and should prevent the weight of the intestines from pressing so much upon the pelvic organs. As for pessaries they will only be of any use when the perineum has preserved a certain amount of tone. Their action may be helped a good deal at times by a perineal pad (figs. 274 and 275). Breisky* says he has obtained good results with

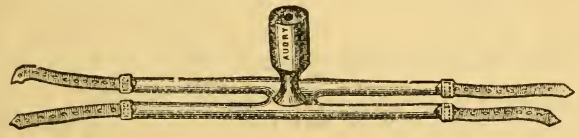

Fig. 278.—Borgnet's pessary.

oviform pessaries, which can obtain a sufficient point of support in old women, in whom the vagina is narrow. One should also try Dumontpallier's ring, Hodge's pessary, Schultze's sledge-shaped pessary, the "gimblette" pessary, Gariel's air pessary. The Zwanck-Schilling pessary, although a very second-rate instrument, is much in vogue.

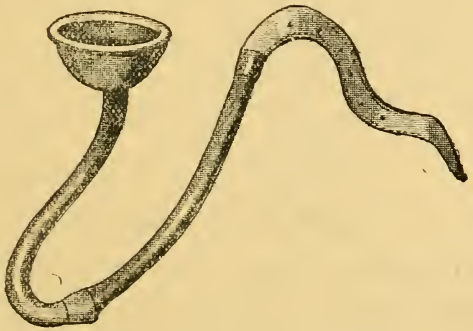

Fig. 279.—Cutter's cup-shaped pessary.

For any of these pessaries to have any chance of success, I must repeat that it is necessary for the perineum still to have some tone, and for the vulva still to be narrow; they are especially suited to cystoceles, but they fail as soon as the uterus takes any important part in the displacement. Besides, they should merely be prescribed as temporary measures, until some radical operation is performed.

* Breisky. Prag. med. Woch., 1884, No. 33.

Should, however, the patient object to all surgical interference, or if there does not seem to be any real chance of success, as in those cases of enormous prolapsus in fat women with pendulous bellies, in whom the vagina and uterus, as well as the other viscera, have really quite lost their footing in the abdominal cavity, the only resource left is to employ stem pessaries kept up by a belt, for which the name of hysterophora* should be reserved. Some models, which are quite analogous, have been furnished by Scanzoni, Courty, and Grandcollot (figs. 276 and 277). The Dumontpallier pessary, which is fixed on a stem which requires a point of support on the surface of the abdomen, constitutes a hysterophora, but the ring requires to be rigid for

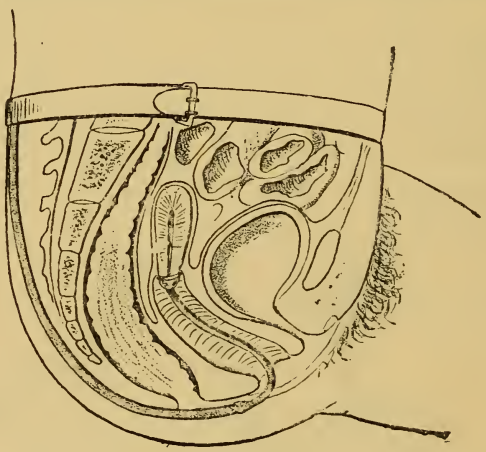

Fig. 280.—Cutter's pessary *in situ*.

it to afford sufficient support. Cutter's pessary, with a stem terminating in a ring or a cup, is very much used in America (figs. 279 and 280). Borgnet's, or the bung-hole pessary, is essentially useful for hospital practice, owing to its solidity and cheapness (fig. 278).

Whatever be the pessary employed, before applying it one should perform the reduction of the prolapsed parts, and take care to try and diminish the congestion of the parts. Should there be any œdema or inflammation, one should begin by keeping the patient at rest in the horizontal position; she should

* Auvard (art. Pessary in Dict. encycl. des sciences méd., series 2, vol. 23, p. 611) suggests calling these pessaries vagino-abdominal.

have frequent baths, prolonged vaginal injections of warm water, glycerine tampons should be applied to the cervix, and massage should be practised. As soon as the tissues have recovered some of their softness, one will, after emptying the bladder and rectum, proceed to the performance of reduction in the position of lateral semi-pronation, or the genu-pectoral position, which will facilitate the entrance of air into the vagina. Should one meet with any difficulty in reducing the parts, one must have patience and not use force.

Surgical treatment.—This offers but little danger, and should be much preferred to the use of pessaries.

One can classify, in the following manner, the various methods which have been employed :—

1. Establishment of an inferior point of support on the side of the vagina, the vulva, or the perineum.
2. Raising the uterus by shortening the round ligaments.
3. Suturing the uterus to the neighbouring parts (hysteropexy), through the vagina or by laparotomy.
4. Hysterectomy.

Before going on to the study of these various operations, one should take note of a preliminary operation intended to facilitate the return of the uterus when the cervix is hypertrophied, which consists in amputation of the cervix uteri, generally found to be a most useful proceeding. Instead of performing it, as does Huguier, without troubling about the future union, one should always take sufficient precautions to allow the edges of the mucous membranes to meet after a conical flap has been removed from each lip (fig. 281). One will avoid wounding the bladder if a male sound is introduced as a guide into the cavity of the organ and held by an assistant ; and one will avoid wounding the peritoneum or rectum if the edge of the knife is always kept directed to the part to be removed. A suture will have to be used to unite the vaginal mucous membrane to that of the cervix. This could not be done if too large a piece of the latter were removed ; one should, however, remember that this is not necessary to set up the process of involution in the remainder of the organ after amputating a small portion of the cervix (C. Braun).

I. *Establishment of a lower point of support.*—The methods of producing this are most numerous. I shall merely indicate those

which have gone out of use, and then describe those which should be adopted.*

Amongst the old-fashioned methods I should mention episiorrhaphy†, or the suturing of the labia majora for narrowing the vulva; freshening up and suturing the vulvar orifice‡; infibulation by means of a metal ring§; and cauterisation of the vaginal wall with various reagents,‖ or with the actual cautery,¶ all abominable methods to revive which an attempt has recently been made. I shall say as much of ligaturing.**

Franck†† performs an operation with the object of obtaining

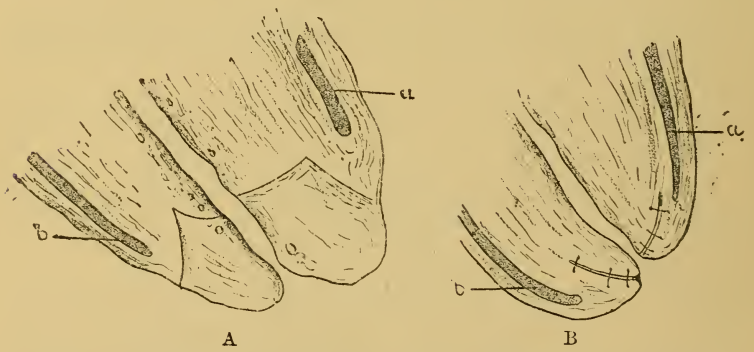

Fig. 281.—Uterine prolapsus, amputation of the vaginal portion of the cervix.

A, before suturing; B, after suturing; *a*, bladder; *b*, Douglas' pouch.

inside the vagina a sort of vertical fold, projecting forwards like a living pad. For this he dissects the vagina right up to near the posterior cul-de-sac and introduces deep catgut sutures so as

* The methods of Schücking (of Pyrmont), of Freund, of Péan, described in the chapter on Retroflexion, have been equally applied to prolapsus.

† Fricke. Annal. der chir. Abtheil. des Krankenhauses in Hamburg, 1833, vol. 2, p. 142.

‡ Malgaigne. Handbook of operative surgery, 1873, p. 738.

§ Dommes. Hanover'sche Annal. fur die ges. Heilk., vol. 5, p. 20.

‖ Phillips. London Med. Gaz., 1839, vol. 2, p. 474 (nitric acid).—Jobert de Lamballe. Gaz. méd de Paris, 1840, No. 5, p. 79 (nitrate of silver).—Desgranges, mentioned by Malgaigne (chloride of zinc).

¶ Laugier, Velpeau, Kennedy, Dieffenbach, mentioned by Schröder, *loc. cit.*, p. 213. —John Byrne (of Brooklyn), Trans. of the Amer. Gyn. Soc., 1886 (Anal. in Amer. Journ. of Med. Sciences, Oct., 1887), is also in favour, after amputation of the cervix, of employing the galvano-cautery to form a cicatricial fold round the stump, and also in favour of cauterising the vagina in lines.

** Gillette. The radical cure of rectocele and cystocele by ligature (Obstet. Soc. of New York, in Amer. Journ. of Obstet., vol. 31, p. 453).

†† Franck. Arch. f. Gyn., 1888, vol. 31, p. 453.

to form a sort of spur. But such is not always the only result of this operation, which also constitutes a sort of colpo-perineorrhaphy.

The excision of a flap from the vaginal wall, elytrorrhaphy or colporrhaphy, was first of all recommended by Marshall Hall.*

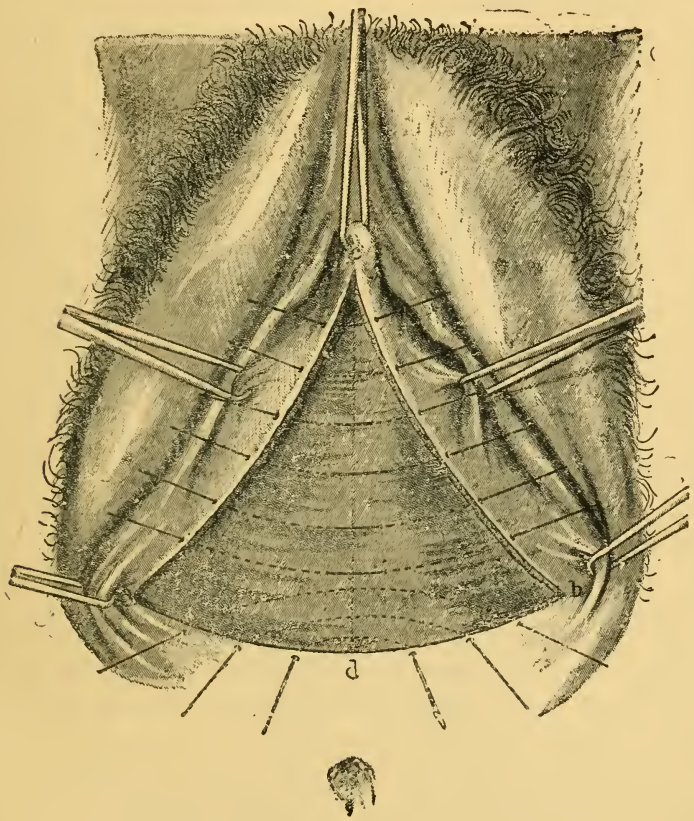

Fig. 282.—Colpo-perineorrhaphy ; Hegar's method.

It is his operation, although an incomplete one, which served as starting-point for the more perfect methods of colpo-perineorrhaphy and perineauxesis performed to-day, all dating back to the method instituted by Simon,† who was the first to understand

* Marshall Hall. Dublin journ. of med. and chem. science, Nov., 1831, vol. 9, p. 269.—Gaz. méd. de Paris, Jan. 21, 1832, p. 32.

† Simon. Prag. Viertcljahrschr., 1867, vol. 3, p. 112.—Engelhardt, Die Retention des Gebärmutter-Vorfalls. Heidelberg, 1871.

the use of freshening up quite freely the surface of the perineum, dipping down at the same time into the vagina; the surface thus acted upon by him was of the shape of a trapezium.

As for colporrhaphy, or anterior elytrorrhaphy, it was well described by Sims first of all.*

Since Simon, there have been a number of lines traced out for freshening up the parts in doing colpo-perineorrhaphy. I shall only give those of Hegar and A. Martin, as well as Doléris' perineoplastic operation.

I shall also describe Professor Le Fort's operation, which deals exclusively with the vagina for the purpose of making a new partition.

Colpo-perineorrhaphy (*method of Hegar*).—The patient having first of all been purged, one passes a sound and cleanses the parts, and she is then anæsthetised and placed in the dorso-sacral position. One can form an idea of the extent of tissue which requires removing, by seizing hold of the posterior wall of the vagina with some forceps and then dragging upon it so as to spread it out. In slight cases it is sufficient to freshen up an isosceles triangle 6 or 7 centimetres wide at its base, which is by the fourchette, and extending up the vagina to a height of 7 centimetres. When the prolapsus is very voluminous, one should increase this by 1 or 2 centimetres.

During the operation, it is well to keep up a continuous irrigation very slowly with tepid water rendered slightly antiseptic (carbolic lotion 10 per 1,000), or simply filtered and holding salt in solution (6 per 1,000). One assistant gives the chloroform. Two others hold the thighs and the forceps. Another one is required to hand the instruments.

To expose the part to be operated upon, dilators are not required; the surgeon uses a pair of bullet-extracting forceps to hold the posterior wall of the vagina (momentarily uncovered from the anterior wall being raised by the valve of a speculum). These forceps are placed in the centre of the posterior wall, 7 or 8 centimetres from the fourchette, so as to correspond with the summit of the triangle on the mucous membrane which is to be dissected. The labia are held apart; two other forceps are placed at the extremities of the proposed triangle, 6 or 7 centimetres apart, at the extreme lower limit of the vagina. Then

* Sims. Uterine Surgery, London, 1865.

two other forceps are placed near the middle of the sides of the triangle. When all these forceps are properly drawn upon by the assistants, the surgeon has his field of operations spread out and tense. With a very sharp curved knife he marks out the limits of the triangle, taking care to make it concave at its base and slightly convex inwards, on the two sides. He then proceeds to dissect the mucous membrane, holding the point with a

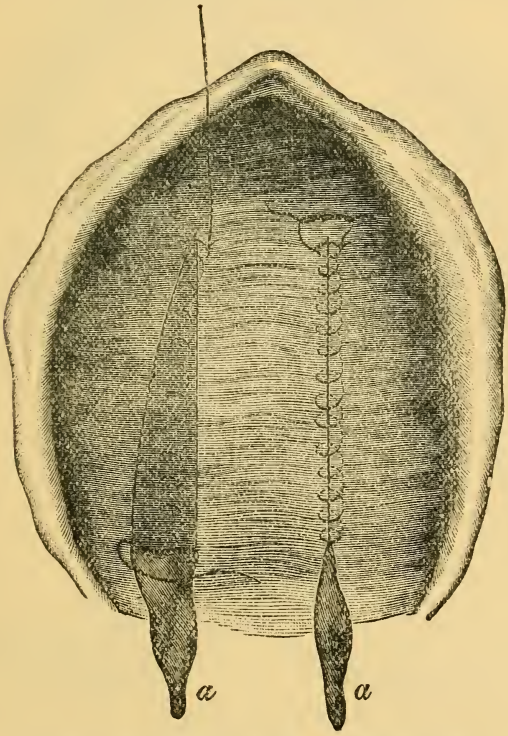

Fig. 283.—Colpo-perineorrhaphy; A. Martin's method.
Continuous suture in superposed layers of the bilateral freshened surface of the vagina.

pair of catch forceps until he has freed it sufficiently to hold it with his fingers instead of the forceps. All this while, one has to drag pretty firmly upon the separated mucous membrane, so as to make its dissection easier. If the recto-vaginal partition is thin, and one is afraid of wounding it, the surgeon may introduce his finger into the anus. This is why one should, before the operation, have cleansed the rectum very carefully with

boracic or salicylic injections, which should be managed by one of the assistants, who should afterwards carefully disinfect himself. Should there be any vessels bleeding freely, forceps should be applied to them. The mucous membrane has to be removed in its whole thickness, which one finds at times increased

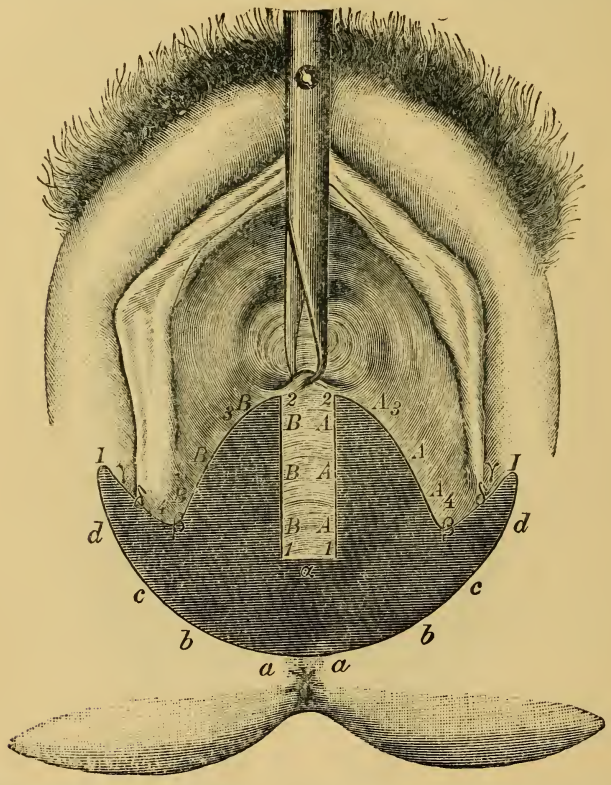

Fig. 284.—Colpo-perineorrhaphy; A. Martin's method. The freshened up surface.

1, 2, incision following the posterior vaginal column.

3, 4, incision along the lateral wall of the vagina.

1, extreme end of the surface which is freshened on the level of the vulvar orifice.—A A, B B, *a a*, *b b*, *c c*, *d d*, *β β*, *δ δ*, *γ γ*, show the points which have to be superposed on each other, after the suturing.

owing to inflammation. The wound has to be cut in as regular a manner as possible with curved scissors, so as to remove any edges or tags of mucous membrane.*

* During the operation of colpo-perineorrhaphy, Douglas' pouch has often been opened. When this occurred, Schauta (meeting of German naturalists and

For suturing, Hegar makes use of silver wire, which he passes under the entire surface of the wound, as far as possible, and between the deep stitches he places superficial ones.

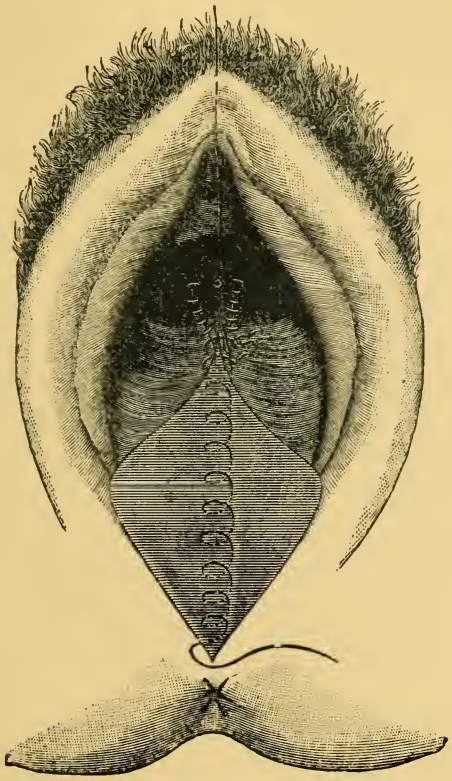

Fig. 285.—Colpo-perineorrhaphy; A. Martin's method. Continuous suture with superposed layers applied to the part of the perineum which has been freshened up (deep layer).

I infinitely prefer the continuous catgut suture in different layers, such as I have described.*

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physicians, Heidelberg, 1889, in Centr. f. Gyn., 1889, No. 43, p. 747) took advantage of the accidental opening to drag out and resect the peritoneal cul-de-sac. This manœuvre should be compared with Freund's operation (ibid., p. 691), which I have described.

* Cohn (Zeitschr. f. Geb. u. Gyn., 1888, vol. 14, p. 518) has published some important statistics with the object of determining the primary and secondary results of plastic operations for prolapsus. He has observed that the best results were given by the deeply placed suture in superposed layers.

Colpo-perineorrhaphy or perineauxesis (A. Martin's method).—The principal object which Martin had in view, when instituting his method, was to preserve the posterior column of the vagina, which forms the part offering most resistance backwards, and which Freund* was the first to recommend to keep intact in all plastic operations. Besides, the bleeding surfaces, although just as extensive, are not all contiguous, but are in three different portions, each placed one above another, which seems to be a much more favourable condition for suturing very exactly and producing a good union.

After having taken the same preliminary precautions as for the preceding operation, Martin catches hold of the posterior wall of the vagina with two pairs of bullet-extracting forceps, immediately below the cul-de-sac, and pulls the parts with some force; the vaginal column (columna rugarum) then appears like a prominent fold, along either side of which one makes an incision with a scalpel; then one marks out and dissects two small lateral flaps, reaching within an inch of the fourchette; at the base of these small flaps, as well as at their summit, bullet-extracting forceps are placed to help to keep the surface to be operated on tense. The two small wounds are joined with a continuous suture in superposed layers (fig. 283); the forceps are withdrawn and the first part of the operation, the double lateral elytrorrhaphy, is then terminated. The second part, or perineauxesis, has still to be done. A transverse incision is made a little above the fourchette, cutting through the column of the vagina, and reaching on each side half-way up to the level of the vaginal ring. From the end of this incision, one starts making another concentric one going off at an acute angle from it towards the base of the labia minora, where it joins the vertical incisions of the elytrorrhaphy. In this way there is obtained a transverse flap shaped as a crescent with its concavity upwards, when it is in a state of rest (fig. 284), and which, when it has its extremities pulled upon, takes the shape of a lozenge. This flap has to be dissected, if the wound is united by means of the continuous catgut suture in superposed layers (fig. 285).

For dissecting the flaps, Martin makes use of a special trowel-shaped knife, and rolls the flaps of mucous membrane on to a

* Freund. Gynäkologische Klinik. Strasburg, 1885.—Here will be found a detailed description and an exposition of the advantages of his method.

sort of rake. A good ordinary scalpel, with a well-marked convex edge, and a pair of plain long forceps, seem to me quite as convenient.

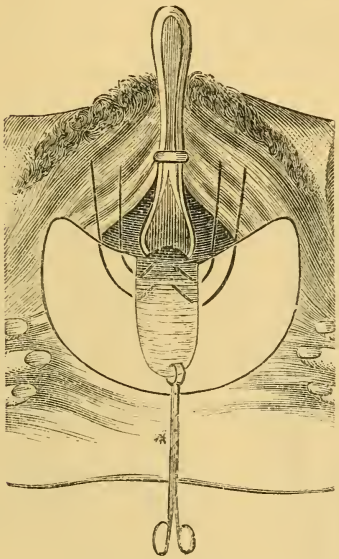

Fig. 286.—Colpo-perineorrhaphy; Bischoff's method.

Bischoff* has recommended a method which, like that of Martin, leaves the vaginal column intact (fig. 286).

Fig. 287.—Colpo-perineorrhaphy; Winckel's method, outline of the parts to be freshened up.

Winckel† freshens up the lower third of the vagina to a height of 2 to 3 centimetres above the remains of the hymen, up to within 3 or 4 centimetres of the orifice of the urethra; he

* See Metzinger. Zur Kolpo-perineoplastik nach Bischoff (Wien. med. Blätter, 1880, Nos. 27 *et seq.*).

† Winckel. Lehrb. der Frauenkr., 1886, p. 299.

stitches the part thus freshened up, and sutures the two small flaps one above the other, like a sort of bridge (fig. 287).

*Colpo-perineoplasty by Doléris' sliding process.**—This ingenious combination of Lawson Tait's method of folding the parts, with Schröder's way of freeing the mucous membrane and Emmet's suture, will be found useful when applied to cases where the

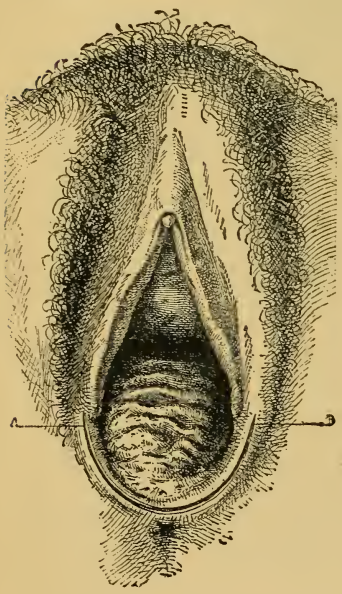

Fig. 288.—Colpo-perineoplasty by the sliding process; Doléris' method.

Semicircular incision running round the posterior commissure of the vulva, at the junction of the skin and mucous membrane, from A to B.

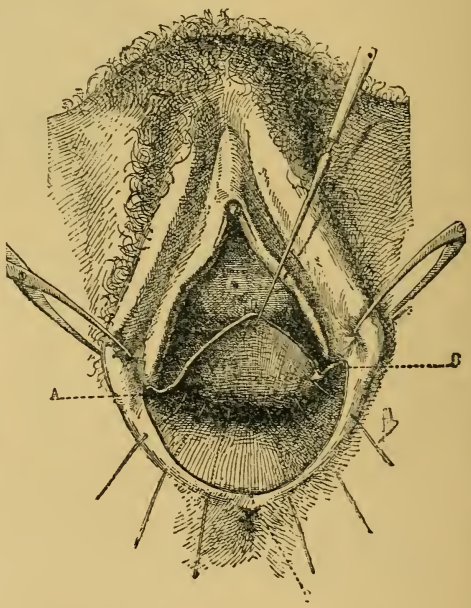

Fig. 289.—Colpo-perineoplasty by the sliding process.

A vaginal flap A, B, D raised by means of a bistoury and the fingers. Introduction of the three threads which are intended to bring the deeper surface of the flap into contact with the cutaneous edge of the incision.

prolapse of the uterus does not exist or is very slight, but where the opening of the vulva being very great, there is a marked tendency to vaginal prolapsus with or without incomplete rupture of the perineum; we have here an excellent means of strengthening the parts with little trouble. At the same time, with-

* Doléris. Paper read before the Obstet. Soc. of Paris, April 11, 1889 (Répert. univ. d'obstet. et de gyn., 1889, p. 345).

out any vaginal suture, the thickness and length of the perineum are rapidly increased. But the weak point about the proceeding, which renders it of a doubtful utility in well-marked cases of uterine prolapsus, is that it diminishes the length of the posterior wall of the vagina, and thus prevents the uterus from rising upwards should it be required. It does not, therefore, admit of being combined with Alexander's operation quite so well as Hegar's and Martin's methods. Lastly, it does not narrow the vaginal canal itself, but only the vulvar orifice; it is in reality a

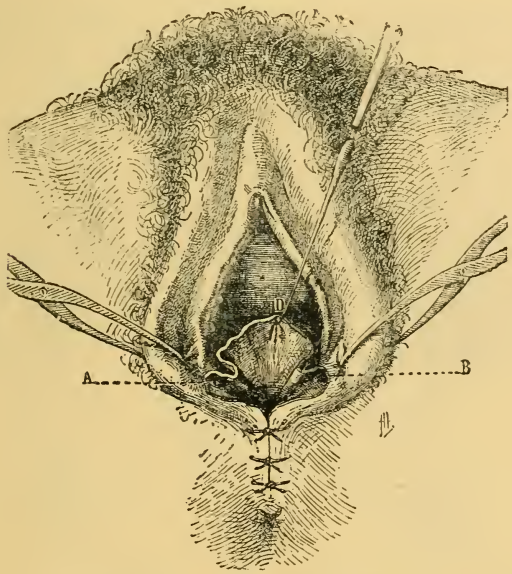

Fig. 290.—Colpo-perineoplasty by the sliding process.

The threads have been tightened; the flap A, B, D is raised, ready to be resected along the line A, B.

pure and simple perineoplasty, for the portion of the vagina removed could never be considerable.

Doléris draws a deep line with a bistoury, making a curved incision at the junction of the skin and mucous membrane. Some forceps are placed at the two external corners to fix the tissues. The upper border of the incision, the mucous one, is slightly dissected, and then removed with some forceps. The surgeon now only uses the index finger of the left hand, introducing it gently amongst the tissues, and separating the vaginal

wall from the rectal wall. The parts are separated as far up as the point selected for the limit of the loss of substance about to be undergone by the vaginal wall, and should be drawn out of the vulva and cut off, whilst a suitable point on this wall should be chosen to fix against the original incision. The parts are kept in contact by means of three stout threads of worm-gut, introduced with curved needles. The first thread introduced is the middle one. The needle enters laterally on the left of the

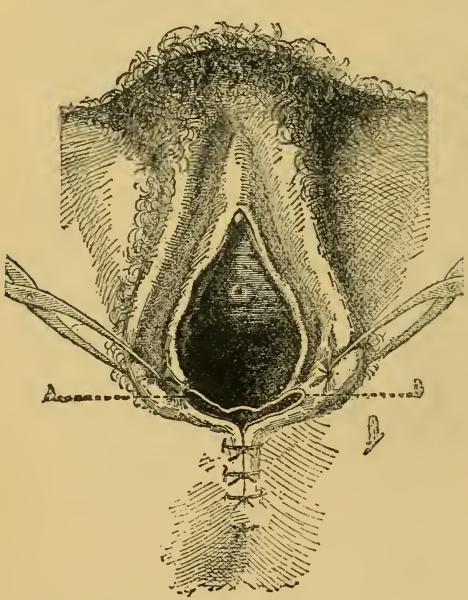

Fig. 291.—Colpo-perineoplasty by the sliding method. The flap has been dissected, the two lateral ears with bleeding surfaces are shown before suturing.

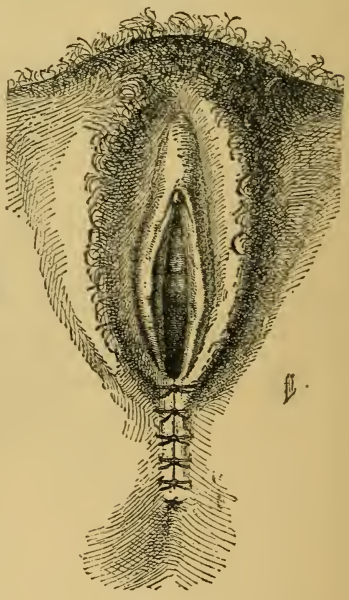

Fig. 292.—Colpo-perineoplasty by the sliding method.
The sutures have all been put in, they are all external.

anus, travels deeply through the tissues, and comes and seizes hold of the vaginal flap quite close to the extreme end of the parts separated; it then either penetrates or not into the vagina, and follows an opposite course, which brings it on to the right side of the anus (fig. 289). This first thread is intended to bring the vaginal wall towards the vulvar commissure, at the same time as it helps to keep together the opposite borders of the incision, comprising the cutaneous edges. The second and third threads are placed in the same way a little to the outer side

of the first. One has then to resert any superfluous part of the vaginal wall, which may be protruding beyond the newly-established fourchette, and to unite the two lips, mucous and cutaneous (figs. 290, 291, and 292).

Colpo-perineorrhaphy is the fundamental operation for pro-

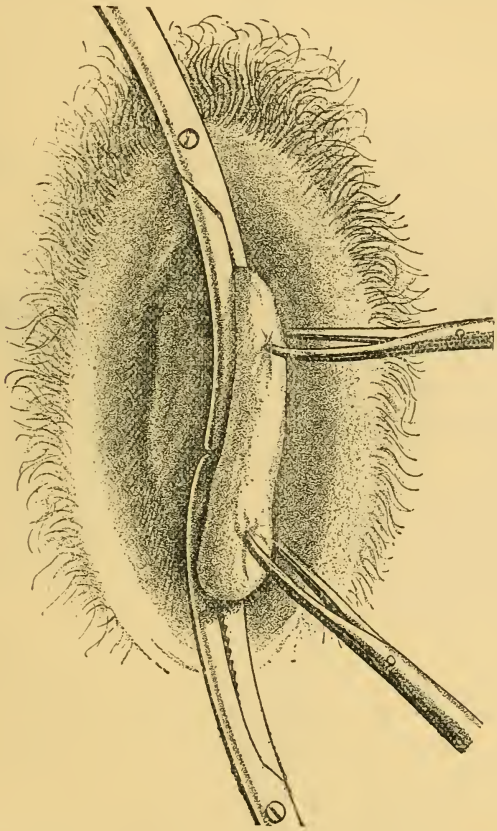

Fig. 293.—Anterior elytrorrhaphy. Forceps placed on a fold of the vaginal mucous membrane.

lapsus of the genital organs. All the same it frequently requires to be completed by supplementary operations, such as amputation of the cervix, already described, and colporrhaphy or anterior elytrorrhaphy. The object of the first is to facilitate the withdrawal of the uterus; of the second, to act directly upon the procidentia of the anterior wall or cystocele.

Anterior elytrorrhaphy used to be performed by Sims in the form of a horse-shoe, the point of which was directed towards the urethra. Emmet made the wound in the form of a brick-

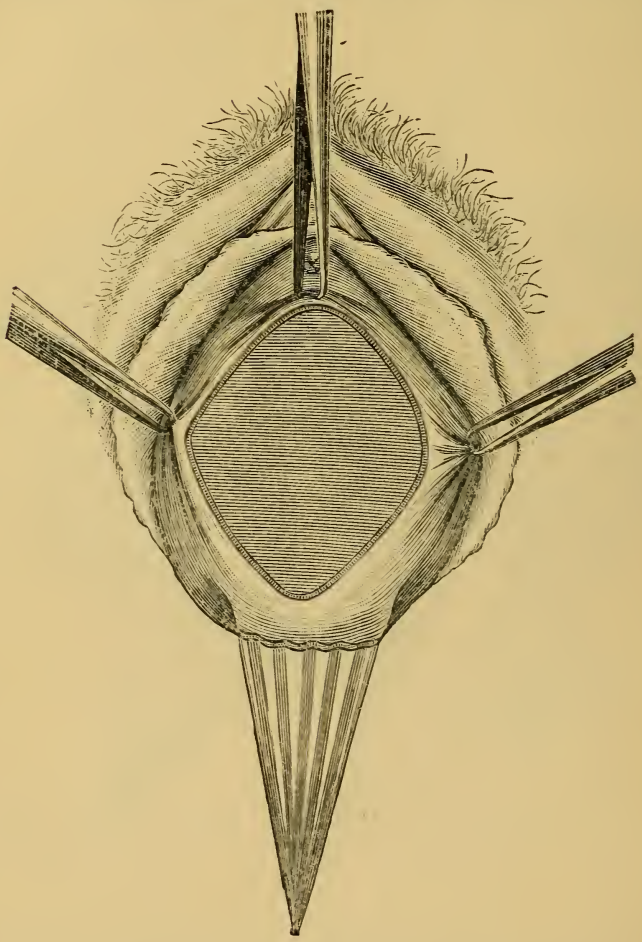

Fig. 294.—Anterior elytrorrhaphy; the flap has been dissected.
The bleeding surface which is about to be closed up by means of a suture introduced in superposed layers is spread out with the help of forceps. In the lower part one sees the bundle of threads coming from the sutures introduced into the amputated cervix.

layer's trowel. Hegar's advice is to give the freshened up surface the form of an ellipse, the upper end of which should be as broad as possible. As a rule it is useless to waste any time

in cutting out a flap of any special shape; one should boldly excise all the exuberant portion of the vagina. I find that a convenient way of doing this is by making a fold in the mucous membrane, with the help of two or three pairs of bullet-extracting forceps, the highest of which should be about two centimetres, and the lowest three centimetres from the orifice of the urethra. This fold is then held by a pair of strong and long curved forceps, and, if necessary, by two pairs of forceps placed in end

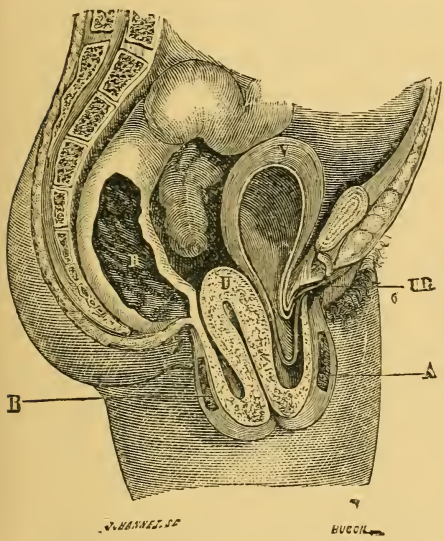

Fig. 295.—Formation of a septum in the vagina, after Le Fort.

R, rectum; U R, urethra; A, anterior raw surface; B, posterior raw surface; U, uterus; V, bladder.

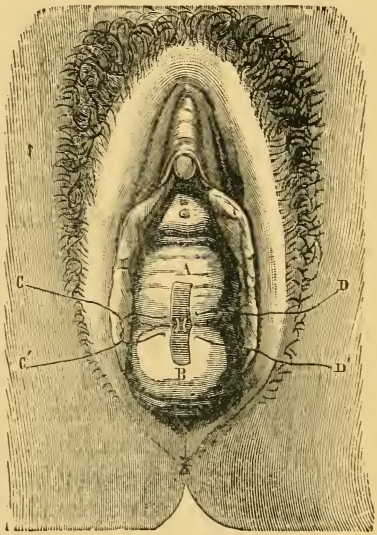

Fig. 296.—Formation of a septum in the vagina, after Le Fort.

A, Freshened up surface on the anterior wall of the vagina; B, freshened up surface on the posterior wall; C C', one of the sutures on the left side; D D', a suture on the right side.

to end (fig. 293). There is no fear of opening the bladder by subjecting this fold to a little firm traction.

Hegar places silver wire threads beneath the forceps (or the clamp) before excising the vaginal fold. I employ the continuous suture in superposed layers, which seems to me to be preferable, so that I remove the mucous fold straight away, and then proceed to suture, as has been explained (p. 51), the parts to be operated upon having first been freely exposed

to view by holding them at suitable points with forceps (fig. 294).

Stoltz, of Nancy, has invented an ingenious method of suturing for anterior colporrhaphy.* After freshening up the parts, he takes a thread, on each end of which is a needle, and uses it to tack the edges of the wound about 1 centimetre from the edge of the cut tissues, so that the thread goes the whole way round the wound as does the string of a tobacco-pouch round the opening of the latter; all one has to do is to pull the two ends, whilst one depresses the denuded surface so as to close the part and push back into the bladder a sort of button-shaped prominence. This method of proceeding used to be the most expeditious, before the employment of the continuous suture in superposed layers, which ought now to replace it.

Stoltz proceeds directly to freshen up the front wall of the vagina by dissecting it with a pair of curved scissors, placing a sound in the bladder so as to depress the front wall.

Formation of a partition in the vagina (L. Le Fort's method).—Le Fort† observes that the descent of the uterus is almost always preceded by that of the vagina, the walls of which become, so to speak, unfolded and then protrude. If one could keep these opposed walls in constant contact with one another, any prolapse would become impossible. This suggested the idea of uniting them by suturing after having removed from each one a vertical slice of the mucous membrane (figs. 295 and 296).

Occasionally the prolapsed uterus becomes increased in volume to such an extent that it is difficult to push it back all at once. To gradually bring about the reduction, the woman has to be left in bed for eight or fifteen days. By that time the passive congestion will have ceased, or at least will be diminished; the uterus will be less bulky. One then allows it to protrude from the vulva, or the patient, by a few efforts, induces it to come down.

One should choose for making a raw surface a site as near as possible to the vulva, since the tendency is for the front and back vaginal walls to become separated from the anterior portion of

* Mundé (Minor surg. gynecol., New York, 1885, p. 522), gives a figure of it.

† Léon Le Fort. New method for curing prolapse of the uterus (Bull. de Thérap., April 30th, 1877).—Manuel de méd. oper. de Malgaigne, edit. 9, 1889, vol. 2, p. 783, and written communication.

the vagina, and thus allow the prolapsus. If one operates too near the cervix, there may be difficulty in bringing together the freshened up parts which are near the uterus, owing to the size of that organ. As a rule, at the time of operating, the surgeon reduces the uterus, separates the vulva, and makes two transverse incisions with the bistoury, one on the anterior wall and the other on the posterior wall at the lowest point where these two walls are in contact (after reduction of the uterus); the two incisions form the lower limit of the two raw surfaces.

The vertical length of the raw surface is 4 or 5 centimetres, the vaginal walls being smoothed out and stretched on account of the uterine prolapsus, which should have been reproduced before commencing to freshen up the parts.

The width of the surface, according to Le Fort's recommendation, used at first to be rather moderate—1 centimetre or 1 centimetre and a half. Now Le Fort makes it broader (2 centimetres). One should not exceed certain limits, for if the freshened up surface is too broad, it is difficult to get the parts to join properly together.

The depth to which one should reach in freshening up the parts should be as slight as possible; it is sufficient for one to have merely a bleeding surface to deal with. If one were to remove all the vaginal portion of the partition, one would run the risk in the neighbourhood of the uterus and posteriorly of getting too close to Douglas' pouch. Tillaux did this once, and the patient died from peritonitis. Le Fort believes this to be the only time that such a mishap has taken place.

In the usual way he begins by means of four incisions to trace out the limits of the flaps, thus rendering their dissection easier.

In Le Fort's first operation silver wire was used for the sutures, and it is what he generally uses, in spite of the difficulty of finding the sutures later on, even if they are left long enough to protrude through the vulva. He failed in two cases in which he used silk threads. These latter cause irritation and inflammation, and the suture fails to hold; he therefore came back to silver wire sutures. To pass them in some operations he only included the edges of the parts freshened up, but he was not very successful; in fact if one only takes up the edges, and the raw surface happens to be rather broad, the middle part does not become united, blood collects in it, and failure is the result. He

now pushes his wires to the very centre of the raw surface. He passes the first thread through the middle of the edge of the raw surface nearest to the uterus; this thread will act as a reducer of the prolapse. When the parts A B are once in contact, owing to the uterus being partly pushed back, all one has to do is to suture the edges. The wire, inserted through the mucous membrane in the direction of the wound on one of the vaginal walls, passes out through this wound and then into the other wound, to come out again through the mucous membrane on the opposite wall of the vagina.

Le Fort leaves the sutures in for fifteen days, sometimes even for three weeks, and only thinks of withdrawing them when he is certain of solid union having taken place. No dressing is necessary.

Such is Professor Le Fort's method.* Out of 40 cases of formation of a septum in the vagina, which he collected in his thesis (1889), André counted 35 successful ones, 31 of which were obtained in the first instance. It is very interesting

* Professor Le Fort's operation differs essentially from that of Spiegelberg (Berlin. Klin. Woch., 1872, Nos. 21 and 22), who sutures the lowest points of the anterior wall of the vagina to the upper part of the posterior wall. Neugebauer (Centr. f. Gyn., 1881, Nos. 1 and 2) claims priority for this method, and it is to him that A. Martin (Path. und Therap. der Frauenkr., p. 138) attributes the merit of having introduced it into his practice. See for history of this subject Skoloff (Annal. de Gyn., 1884, vol. 21, p. 13).—Neugebauer called his operation elytrorrhaphia mediana sive elytrocleisis partialis mediana (1867).

One might perhaps discover some method anterior to that of Le Fort in the practice of another French surgeon, Jobert de Lamballe (mentioned by Le Fort-Malgaigne, Manuel de méd. opér., edit. 9, 1889, vol. 2, p. 779). His method of excising and suturing the vaginal wall consisted in removing from the anterior wall two longitudinal flaps of the mucous membrane, with a certain interval between them where the mucous membrane was left intact. By bringing the bleeding surfaces into apposition and suturing them, a permanent fold was produced, which narrowed the vagina. But this narrowing was produced by a lateral and not a median partition as in Le Fort's method.

Jobert had done nothing more than improve upon the method of Gérardin (of Metz), who as early as 1823 proceeded to obliterate the vagina by freshening up for a certain extent the lower portion of the two walls and then suturing the two surfaces. See André, On the treatment of uterine prolapsus by Le Fort's operation. Thesis for M.D., Paris, 1889.—Eustache (Bull. et Mém. de la Soc. de Chir., Nov. 1881, p. 826) has performed Le Fort's operation with some modifications. He freshened up a surface extending over 6 centimetres, from the cervix to the vulva, and recommends the use of catgut. He had two failures with Le Fort's method, and five cases of success with the modified operation.—Ch. E. Taft (Le Fort's operation for complete procidence of the uterus, with report of a case, in Amer. Journ. of Med. Sciences, Aug., 1889, p. 128) has reported a successful case in America. The first instances of Le Fort's operation in that country were in the practice of Fanny Berlin (Amer. Journ. of Obstet., 1881, p. 866), who reports three cases.

to observe that this operation does not prevent either coïtus, fecundation, or parturition. This latter occurred normally in one of Le Fort's cases which had been operated on a long time before. All that was required was to cut through the septum to allow the fœtus to pass.

After-treatment in colpo-perineorrhaphy.—The object of these plastic operations being to strengthen the perineum and to narrow the vagina, the after-treatment is very important if one wants to insure union by first intention. Should this union not take place, the result is nearly always a failure, although some cases have been mentioned where some success has been obtained after allowing granulation and union by second intention to take place.

The line of sutures should be powdered with iodoform and covered over with iodoform gauze. One should avoid tying in a catheter as it sets up cystitis. It is better to draw off the urine every two or three hours with a perfectly aseptic catheter. Ought one to keep the bowels from acting or provoke an early action? I think it better to keep the bowels at rest till the fourth day, and then to use an enema. Care should of course have been taken to have given the patient a good purging, and to have thoroughly cleaned out the rectum before the operation. It is sufficient to give two pills containing 0·02 centigrammes of opium daily, with low diet to prevent the bowels being evacuated prematurely. Should the patient have the feeling that the bowels are about to act, a suppository should be prescribed containing 10 centigrammes of extract of opium. On the tenth day I administer 30 grammes of castor oil, and two hours later an enema of four spoonfuls of sweet almond oil and two of glycerine. After that the regular action should be seen to. The patient should not rise before one month.

Prognosis. Immediate and latter results of colpo-perineorrhaphy.—Those recognised gynæcologists who have often performed this operation hold up its great safety and its efficacy.

In what follows I shall especially have in view Hegar's method, which seems to me the most practical; and that of Martin, which also offers serious advantages when the posterior wall of the vagina is exceptionally loose and corrugated; should one desire, in these latter cases, to apply Hegar's method, one would, ac-

cording to his own advice,* be obliged to begin some time previously by performing an elliptical anterior elytrorrhaphy.

The complications one has to dread are the following: opening the peritoneum, which is not a very serious matter if rigid antisepsis has been carried out; wounding the rectum, which careful suturing will remedy; suppuration and giving way of the suture. to be guarded against by carefully preparing the catgut and taking the most minute precautions against infection.

Out of 400 operations performed in his wards, Hegar had two deaths from septicæmia, and each time he was able to trace the origin of the infection to cases previously operated upon. Dorff,† Hegar's assistant, published some interesting statistics on the latter results of 136 operations. He was only able to collect accurate information about 63 patients; out of this number 53 had remained cured (some of them since 10 years), 9 had been confined without any complication or any relapse; 10 operations were followed by failure either early or late, two of them after parturition.

Some recent results are still more satisfactory: during three years and a half, out of 150 operations, Hegar has not had a single failure.‡ Ernest Cohn§ when collecting in a very careful report the cases in Schröder's practice, found that amongst 74 women, that it had been possible to follow up, 46 were definitely cured, that is, about 62·2 per 100.‖ The hospital cases alone give 56·6 per 100, and the private cases 86·7 per 100 (the operation was performed according to Hegar's method with the continuous suture in superposed layers, the suture being catgut dipped in juniper oil). Three of the patients were confined without any complication or any unfavourable result.

II. *Raising the uterus by shortening the round ligaments.*—This is the Alquié-Alexander-Adams operation. I refer the reader to the chapter on Retroflexion for its detailed description (p. 152). This operation, when applied by itself to the treatment of prolapsus, has generally given rather indifferent results.

* Hegar and Kaltenbach. *Loc. cit.*, French transl., p. 577.

† Dorff. Wien. med. Blätter, 1879, Nos. 47-52, and 1880, Nos. 1, 4, and 5.

‡ Hegar and Kaltenbach. Ibid. (3rd German ed.), p. 773.

§ E. Cohn. Ueber die primären und definitiven Resultate der Prolapsoperation (Zeitsch. f. Geb. und Gyn., 1888, vol. 14, p. 518).

‖ It is evident that the author was making a mistake in putting down 67·5 per 100.

although some very successful cases have been published.* But it is a first rate operation when combined with some plastic operation of the perineum and vagina, in thin women in whom the abdominal wall is not too much relaxed. It seems to me that its principal action consists in reducing the retroversion which accompanies prolapsus and is one of its factors.

III. *Suturing the uterus to the abdominal wall; gastro-hysteropexy.*†—For the details of the operation, and the historical

* Polk. New York Obstet. Soc., April 6, 1886 (Amer. Journ. of Obstet., June, 1886, p. 606), mentions 15 cases followed by success; he then gave up doing any plastic operation of the vagina; the success in these cases must therefore have been due entirely to shortening of the round ligaments.

† Along with gastro-hysteropexy one might mention a new operation, which has been described and performed by H. T. Byford, for the cure of cystocele, and which he proposes as an addition to Alexander's operation, using the same incision which is deepened so as to penetrate into the cellular tissue and suture the vagina. Byford incises the inguinal canal, reaching into the cellular tissue behind the pubis (cavity of Retzius); he separates this tissue from the pubis, and ascertains the position of the ureter by bimanual palpation. He then passes a needle holding some silkworm gut from above downwards, until it goes through the vaginal wall into the left lateral cul-de-sac. The needle is then pushed from below upwards through the vagina at a quarter of an inch distance from the point of entry, and it is made to come out through the inguinal wound. One has thus a loop of silkworm gut, including a small part of the anterior vaginal wall; with another stitch a firm hold is got of the cellular tissue. The threads are then tightened and knotted upon the inguinal canal, thus closing the incision in its posterior aspect. In this way the vaginal wall is drawn towards the middle of the body of the pubis, and raises the bladder. The same operation is performed on the other side.

A point of great importance, according to Byford, is to include in the suture a portion of the mucous membrane of the vagina when the threads enter and become gradually hidden, as this will increase the strength of the union. But great care should be taken when operating on the two sides not to let the sutures get too near the urethra for fear of its getting narrowed. Great care should also be taken to avoid the ureter. Byford has performed this operation twice. The first time he failed, which he attributed to insufficient amount of attention to details. The second time he succeeded, although he introduced one suture on the left side. The latter case, however, is not at all convincing. In fact, it is that of a woman in whom vaginal hysterectomy had been performed; and what is more, at the same sitting, Byford performed double elytrorrhaphy with Martin's colpo-perineorrhaphy. It is very likely that the last operation by itself was sufficient to insure success; in any case it is difficult to say what share should be assigned to the first operation.

Henry T. Byford ("The cure of cystocele by inguinal suspension of the bladder: colpo-cystorrhaphy," in Amer. Journ. of Obstet, Feb. 1890, vol. 23, p. 152) prefers giving to his operation the name of colpo-cystorrhaphy, which to me seems very improper, since although one may raise the bladder, one does not suture it to the vagina, but it is the abdominal wall which one sutures. One should therefore use the name laparo- or gastro-colpopexy.

Some other surgeons have performed cystopexy (De Vlaccoz, Dumoret, and Tuffier). The two first, after having laid bare the bladder by laparotomy, fix it to the abdominal wall, but whereas Vlaccoz sutures both the muscular and the serous coats of the bladder to the parietal peritoneum, Dumoret fixes more especially the vesical

sketch of this method, I refer the reader to the preceding chapter, where I dealt with retroflexion.

Should there be such a complication as an abdominal tumour, a fibroma, or a cyst, an excellent way of remedying matters is to perform laparotomy and fix the pedicle in the wound. I have seen one of my patients thus cured after ovariotomy. Schröder mentions similar cases, and some analogous facts, which I have cited in speaking of the history of gastro-hysteropexy (see p. 164), occurred in the hands of Olshausen, Brennecke, Weist, &c.

It is very important to observe that it is not for all varieties of genital prolapsus, but only for descent of the uterus itself that hysteropexy can be of use. The mere appearance of the relaxed vaginal walls protruding through the vulva as a cystocele or rectocele would not justify one in fixing the womb, if the latter were not prolapsed. The prolapse would only be incompletely cured by gastro-hysteropexy alone, even when both uterus and vagina were involved, if the case happened to be at all inveterate, and accompanied by any considerable distension of the vaginal mucous membrane and supra-vaginal hypertrophy of the cervix. From a theoretical as well as from a practical point of view, hysteropexy can only be an operation sufficient in itself, in those comparatively rare cases in which the uterus, without being increased in size, has alone descended. In all other cases a complementary operation, involving the cervix, the vagina, or the perineum, will be necessary. Huguier's conoidal or Simon's biconical amputation, anterior and posterior elytrorrhaphy, colpoperineorrhaphy, according to the various methods, formation of a septum by Le Fort's process, &c.

So that from this point of view, hysteropexy has no advantage over Alexander's operation, which also is rarely sufficient in these complicated cases, and even then only plays the part of a valuable auxiliary. We have therefore to compare the shortening of the round ligaments with gastro-hysteropexy, both as regards prognosis and efficacy.

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peritoneum. In both these cases one has to do with an intra-peritoneal anterior cystopexy. Tuffier (Bull. et Mém. Soc. Chir., 1890, vol. 16, p. 454, *et seq.*, and Ann. de Gyn., July, 1890) performs, on the contrary, an extra-peritoneal abdominal cystopexy; he makes the incision proper to hypogastric lithotomy on a level with the cavity of Retzius, and sutures the bladder laterally, right and left.

It is useless to dwell much on the first point; the relative safety of Alexander's operation is evident. This consideration does not, it is true, resolve the question, but it shows that the duty of any surgeon is only to have recourse to the more serious operation after having attempted the milder one.

We have still to deal with the question of efficacy. Since we have no facts to go upon in forming an opinion, we cannot speak very definitely about the value of gastro-hysteropexy as a remedy for prolapse. The operations have been too few and too recent. One of the first patients operated on by Olshausen,* had a return of the trouble very shortly; it is true that the sutures did not seem to have been in sufficient number (two worm gut stitches on the insertion of each round ligament). Another of the same surgeon's patients, in whom the uterus was fixed in the course of an ovariotomy, was perfectly well in 1886, a year and a half after. In one of Phillips' patients† the cure had been maintained for six months at the time of the publication of the case. There, again, it was the pedicle of a removed ovary which had been fixed. Dumoret‡ has mentioned 8 cases of success out of 11 operations of this sort. Terrier's 3 patients and Tuffier's § 1 appear not to have been seen again, and cannot aid one in forming an opinion. The proportion, giving two failures and one death, is not to be treated lightly, and hardly justifies the enthusiasm some surgeons have shown for this operation.

In other countries surgeons do not appear to be in favour of hysteropexy for prolapsus. Kelly‖ is very definite in disputing its value. Müller, who has performed it some 12 or 15 times, had nothing but bad results. He found that the uterus and vagina descended again; in many cases the adhesions to the abdominal wall gave way; in many others they still remained,

* Olshausen (Centr. f. Gyn., 1886, pp. 667 and 698) was the first to perform hysteropexy (which he calls ventro-fixation) for prolapsus; he created the method. Leopold and Czerny modified his proceeding for the retroverted uterus. Terrier, the first in France, applied Olshausen's method to the cure of prolapse, and Czerny's method slightly modified to the cure of retroflexion.

† J. Phillips. On ventral fixation of the uterus for intractable prolapsus (Lancet, Oct. 20, 1888, vol. 2, p. 760).

‡ Dumoret. Laparo-hysteropexy for prolapsus. Thesis for M.D., Paris, 1889, p. 99.

§ Dumoret. *Loc. cit.*

‖ H. Kelly. Amer. Journ. of Obstet., Jan., 1887, vol. 20, p. 33.

but were dragging upon and depressing the abdominal wall. Hofmeier did not see any good results from it in Schröder's hands. Freund, by way of explaining these failures, observes, that even after removal of a myoma, and fixing the pedicle outside the peritoneum, the latter may be found to become detached from the wall. Fehling, out of three cases, had one failure.*

Besides, if there is much hypertrophy of the cervex, and any prolapse of the vagina, in spite of fixing the uterus, and even removing it, one will not prevent the vaginal prolapse from recurring with all its accompanying troubles. This is what has already happened to some surgeons who had performed vaginal hysterectomy. Such an unfortunate result was also obtained by Müller (of Berne), after a relatively serious operation (supra-vaginal abdominal hysterectomy, with fixation of the pedicle in the abdominal wound). This author had performed a mutilation of this kind for prolapsus on as many as three occasions.†

IV. *Vaginal hysterectomy.*—I believe that abdominal hysterectomy, except in cases of fibroma, is unjustifiable. As to vaginal hysterectomy, although less dangerous, it is yet much more

* Müller, Hofmeier, Freund, Fehling. Meeting of German naturalists and physicians. Heidelberg, 1889 (Centr. f. Gyn., 1889, No. 43, p. 747).

† J. Rendu ("Notes on some travels abroad to gather information on obstetrics and gynæcology" in the "Lyon médical," 1881, vol. 36, p. 345) has published the results of one of Müller's operations under this title: "Enormous uterine prolapsus; laparotomy followed by amputation of the upper portion of the uterus and by fixation of the stump in the abdominal wound; relapse." A woman of thirty-eight years, who had given birth to one child, was suffering from a complete prolapse of the uterus. Müller had already performed colpo-perineorrhaphy in December, 1878, following Bischoff's plan, but without any result. On the 16th of June, 1879, after opening the abdomen by an incision 4 or 5 centimetres long in the course of the linea alba, he introduced a sound into the uterus and carried that organ up into the wound; then placing a clamp upon the uterus, he excised the upper portion, and fixed the remainder to the edges of the wound in the abdominal wall. The patient got well, and was up on the 16th of July. When Rendu passed through Berne in November of the same year, menstruation had already taken place on two occasions in the form of a sanguineous oozing from the vulva and the abdominal wound. This latter was deeply drawn in, or rather it was at the bottom of a narrow infundibulum formed by the walls of the abdomen. The uterus was again prolapsed as formerly. The cervix was some 7 centimetres outside the vulva, the lips were large, congested, and into its cavity one could introduce the whole of the first phalanx of the index finger.

This fact seems to me to be a proof that it is not sufficient to support the uterus (even when reduced to a stump) from above, when the hypertrophy of the cervix and the vaginal prolapsus are constantly dragging it downwards; gastro-hysteropexy, like Alexander's operation, except in very rare cases of simple prolapse of the uterus, should therefore always be combined with a supplementary operation on the cervix, the vagina, or the perineum, if one wishes to get lasting results.

serious than any of the plastic operations. One should therefore only resort to it in the last extremity. One ought also to observe that even after its performance the vagina may remain prolapsed, and may still require colpo-perineorrhaphy, although one may have taken care to remove at one sitting a large segment of the vaginal mucous membrane.

Leopold,* who resorted to this plan, was not favoured by the result. Müller, who resorted to it on three occasions, was twice obliged to perform colporrhaphy later on. Baumgärtner observed a vaginal hernia come on after this operation. On the other hand, Kehrer† has met with success when employing it for prolapsus which had returned. R. Asch‡ mentions as many as 8 cases of hysterectomy for prolapsus performed in Fritsch's clinique. The latter combines the operation with a large resection of the vagina. Braun§ in a case of prolapsus, which had returned in spite of some plastic operations, has extirpated the entire uterus. I have myself performed vaginal hysterectomy, combined with anterior and posterior colporrhaphy for a case of complete prolapsus. The good result was still maintained at the end of six months.

Choice of the operation.—The following is a brief account of the therapeutic measures suitable for the various types of genital prolapsus which I have mentioned.

For temporary palliative treatment, pessaries or hysterophera to be applied after the prolapse has been reduced by rest, baths, tampons, and, if need be, amputation of the hypertrophied cervix.

Massage‖ has been very much praised of late as useful in most

* See Münchmeyer. Congress of German Gynæcologists. Friburg, 1889 (Centr. f. Gyn., 1889, No. 31, p. 544).

† Müller, Baumgärtner, Kehrer. Meeting of German naturalists and physicians, Heidelberg, 1889 (Centr. f. Gyn., 1889, p. 747).

‡ Robert Asch. Exstirpation des Uterus mit Resection der Scheide wegen Vorfalles (Arch. f. Gyn., 1889, vol. 35, Heft 2, p. 187).

§ C. v. Braun. Centr. f. Gyn., 1891, No. 28, p. 596.

‖ F. Sielski (Das Wesentliche der Thure Brandt'schen Behandlungsmethode des Uterusprolapses, in Centr. f. Gyn., 1889, No. 4, p. 49) speaks in favour of massage and a modification which consists in reducing the uterus with a sound with a bulbous end. E. Stroynowski (Centr. f. Gyn., 1889, No. 29, p. 505) has published two cases of prolapse of the uterus, cured by means of massage by two persons, as recommended by Brandt.—K. Pawlik (Beitrag zur Behandlung des Gebärmuttervorfalles, in Centr. f. Gyn., 1889, No. 13, p. 217) has tried massage in prolapsus and has only had negative results.

affections of the uterus, and especially in prolapsus. I believe it can in this case be of real service, if combined with rest and the use of baths, in reducing the size of the prolapsed parts, and facilitating their reduction. Brandt is greatly in favour of massage performed by two persons: one of them raises the uterus with one or two fingers introduced into the vagina, the other one pushes his flattened hands down in between the uterus and the symphysis and presses with the tips of his fingers as deeply as possible, then he raises them and depresses them alternately about a dozen times. One sitting every day for a week would be sufficient.

It would of course be quite hopeless to expect any lasting benefit from any such spontaneous reduction of the organs. All one will ever be able thus to obtain will be some temporary relief which will not allow one to dispense with a plastic operation.

As for radical treatment, one has to recognise several classes of cases.

1. *Simple procidentia of the vagina without hypertrophy of the cervix, and without any very marked prolapse of the uterus.*—Anterior elytrorraphy and colpo-perineorrhaphy (Hegar's method) when the vagina is much enlarged; in cases of slight cystocele, anterior elytrorrhaphy, followed by colpo-perineoplasty by Doléris' sliding process, to increase the support of the perineum.

2. *Vaginal procidentia and prolapse of the uterus, with hypertrophic elongation of the supra-vaginal portion of the cervix.*—Biconical amputation of the cervix, anterior elytrorrhaphy, and colpo-perineorrhaphy, Hegar's method, should as a rule be adopted, but preference should be given to that of Martin, if the vagina is very large and flaccid; a much larger portion of the surface can thus be removed.

When the body of the uterus is itself sensibly prolapsed, the round ligaments should be shortened immediately after amputation of the cervix, before any plastic operation is performed on the vagina.* Should these means fail, gastro-hysteropexy will

* This combination of several methods for the cure of prolapsus of the genital organs, and especially joining Alexander's operation to colpo-perineorrhaphy, was first suggested by that author himself. Doléris (Nouv. Arch. d'Obstet. et de gyn., 1886, p. 350, and 1890, p. 118) has been greatly in favour of this combined method. —The shortening of the round ligaments seems to me to be specially useful in

have to be combined with the operations dealing with the vagina.

In cases of complete and obstinate prolapse of the uterus and vagina, when the parts are much hypertrophied and can only be reduced and kept up with difficulty, when they have, so to speak, quite lost their right of abode in the pelvis, one would be justified in performing vaginal hysterectomy, followed by a free excision of the vagina, and later on by colpo-perineorrhaphy, so as to considerably narrow the vulvar orifice.

3. *Descent of the uterus and vagina without hypertrophy of the cervix.*—Shortening of the round ligaments, then colpo-perineorrhaphy (Hegar's or Martin's method, according to the greater or lesser spaciousness of the vagina), or Le Fort's process of forming a partition in the vagina.

Lastly, since there is metritis to be found in all cases of prolapse, the uterus always requires to be scraped with the curette in the first instance.

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prolapsus, by reducing the retroversion which usually accompanies it, and which is a great cause of relapse.

So one sees that there may be as many as five operations to be performed, one after another, on the same patient; but they are all mild and short ones; the whole series may be terminated in an hour, owing especially to the saving of time in using the continuous suture in superposed layers.

CHAPTER IV.

INVERSION OF THE UTERUS.

Definition, division.—Pathogeny and etiology.—Morbid anatomy. Recent puerperal inversion. Chronic inversion.—Symptoms.—Diagnosis from polypus; inversion accompanied by polypus; simple prolapse.—Course of the disease and prognosis.—Treatment. Forcible methods. Manual reduction. Taxis with instruments Laparotomy and reduction performed through the peritoneum. Mild methods. Continuous pressure with an air pessary, the colpeurynter, pessary producing elastic pressure, plugging with iodoform gauze. Partial hysterectomy. The linear écraseur, clamp; galvano-caustic wire; slowly acting elastic ligature; ligature producing elastic traction. Partial hysterectomy with a sharp instrument. Complete hysterectomy.

Inversion of the uterus means the condition of that organ when it is turned upon itself and invaginated, in such a manner that the fundus, pressed down in the shape of the finger of a glove, forms more or less of a prominence either in the interior of the uterine cavity or in the vagina.

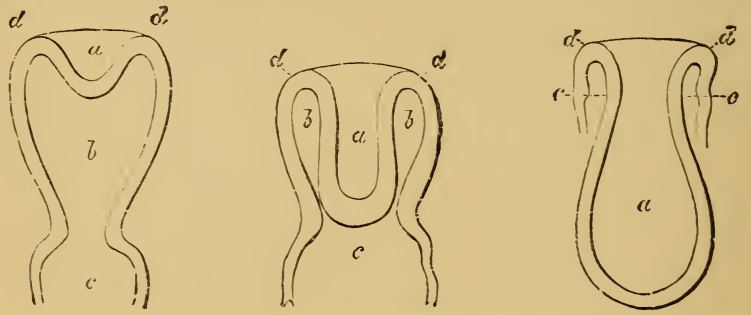

Fig. 297.—Inversion of the Uterus.

Diagram showing the three degrees; *a*, inverted fundus; *b*, uterine cavity; *c*, vagina; *d*, upper border of the depression formed by the inverted fundus.

The first stages of this inversion generally escape observation, and may be merely temporary. It is necessary for the organ to pass beyond the cervix, and to form a tumour which can be both seen and felt, before it attracts attention. The various degrees recognised and figured by classical authors (fig. 297) are only

interesting from a theoretical point of view. The distinction between complete and incomplete inversion is not much more important: complete invagination, when the rim formed by the cervix no longer exists, is so very rare that only some doubtful cases have been mentioned; they do not deserve to be made into a special class.

The only useful division for clinical purposes is that of simple inversion (fig. 298), and inversion with prolapse (fig. 299).

Pathogeny. Etiology.—For inversion of the uterus to take place, it requires a portion of the body, after becoming inert, to

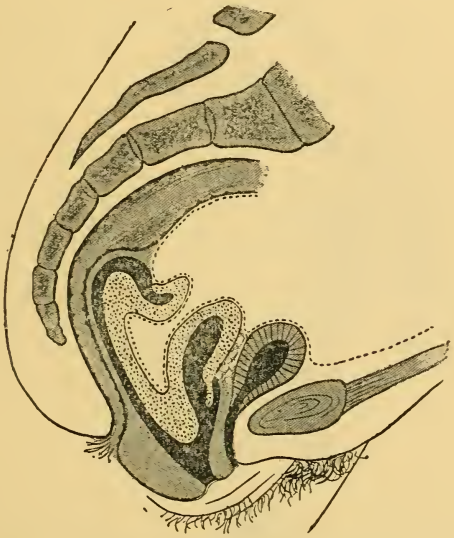

Fig. 298.—Inversion of the uterus which is situated low down, but without prolapse.

be acted upon by the contractions of that part of the uterine muscular tissue which is situated just above it. These conditions are fulfilled in two different orders of circumstances: after parturition, or as a sequel to the presence of a fibroid tumour pointing into the cavity. In both cases, in fact, the uterus is hypertrophied and dilated; in both there is on its surface a zone which is found to be inert and depressed. In the case of parturition it is the region to which the placenta was adherent, so much so that Rokitansky* has been able to describe the affection

* Rokitansky, quoted by Hart and Barbour. Manual of Gynec., Fr. transl., 1886, p. 411.

as "paralysis of the placental zone"; in cases of fibroma it is the surface from which the tumour grew. Any traction upon the cord from below, any excessive pressure from above in cases of uterine inertia, is likely in such cases to bring about the depression of the fundus of the uterus; if the rest of the organ is then undergoing contraction, the depressed portion is, so to say, caught hold of, and an automatic movement, similar to that of deglutition, causes it infallibly to pass through the cervix uteri; one should, in fact, notice that a form of passive retro-

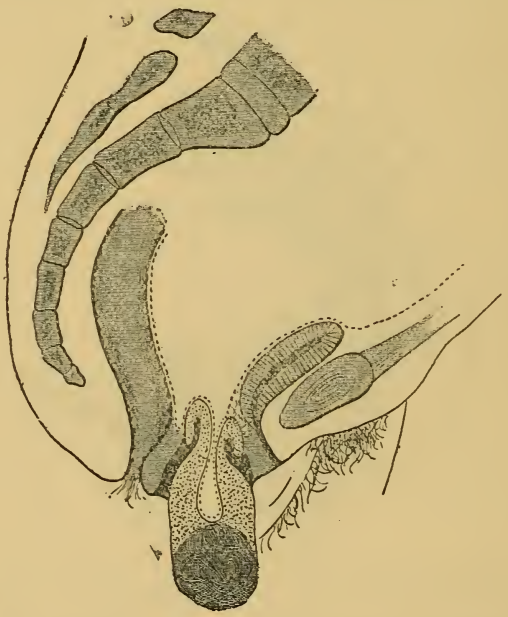

Fig. 299.—Inversion of the uterus and prolapsus caused by a fibrous tumour.

version begins to take place, which gives rise to contractions with a backward direction.

Amongst the most usual causes of this affection, one should mention shortness of the cord; undue traction exerted upon the placenta; abnormal adhesions of that organ on its insertion into the fundus of the uterus; delivery in the erect position. Partial inversion has in these cases often taken place unknown to the accoucheur; and then the uterus, with its fundus depressed "like the kick in a bottle" (Mauriceau), continues to descend during

the days immediately following delivery, and the inversion, which was there in the first instance, only becomes apparent after some days. At times its appearance takes place slowly and insensibly, at others suddenly.

This puerperal origin is the most frequent. Cross,* out of 400 cases of inversion, found 350 following delivery and 50 due to polypi. This latter cause is less important. Fibrous tumours, fibro-sarcomata inserted into the fundus of the uterus, especially those upon which attempts at traction have been made, may cause inversion even in nulliparæ. It is well known that the presence of these tumours produces a state of hypertrophy and congestion in the uterus, which somewhat resembles that of the gravid uterus (fibrous pregnancy).

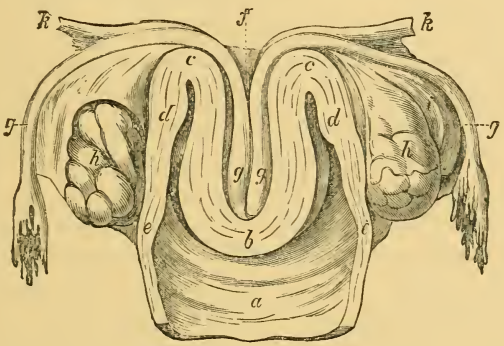

Fig. 300.—Inversion of the Uterus.

a, vagina; *b*, fundus uteri; *c c*, upper margins of the inversion; *d d*, portion of the cervix which remains non-inverted; *f*, cul-de-sac formed by inversion of the fundus; *g g*, tubes drawn in by the inversion; *k k*, round ligaments; *h h*, ovaries; *i i*, broad ligaments.

Inversion is a rare affection. Beigel, after hunting up the statistics dealing with it, found that it is to be met with once in 190,000 labours.

Morbid anatomy.—An important distinction is that between recent puerperal inversions and chronic inversions. The particular state of the uterus at the time of delivery establishes a radical difference between these two affections.

In the first there exists one variety of inversion, which might

* An essay, literary and practical, on inversio uteri (Trans. provinc. med. and surg. Assoc., London, 1845).

be called acute, a formidable complication which may cause death from violent hæmorrhage. I need not dwell here upon this clinical variety, which is essentially obstetrical.

By recent puerperal inversion, I shall only mean those cases in which the apparition of the tumour constitutes the principal phenomenon that the treatment has to deal with, and is brought to the surgeon's notice very shortly after delivery (a month and a half, on the average), and in which involution of the uterus cannot come to a proper termination. By chronic inversion, I shall mean the cases which date further back.

In recent puerperal inversion, the cup formed by the depression of the fundus of the uterus is generally very marked and contains the tubes, the ovaries, and sometimes some coils of intestine (fig. 300). Later on the cavity disappears and a mere slit remains. The uterine tumour is fairly large; its tissue, which has not yet undergone complete involution, is spongy and vascular. Its soft and velvety surface is in contact with the vaginal mucous membrane; on looking carefully, one can see two small lateral openings, about 2 centimetres apart, into which a bristle can sometimes be introduced; these are the openings into the tubes. The upper part of this tumour, which is piriform, is surrounded by the cervical ring; when the latter takes part in the inversion, it does so irregularly, more posteriorly than anteriorly, and the anterior cul-de-sac maintains a greater depth than the posterior one. On the mucous membrane of the uterus are to be observed the macroscopic and microscopic lesions of glandular endometritis.

Chronic inversion without prolapsus forms a tumour which in appearance and consistence greatly resembles a fibrous polypus; the pedicle is represented by that portion of the body of the uterus which has been squeezed in passing through the opening of the cervix. The latter maintains its normal position; in some very exceptional cases, where the inversion is complete, the circular pad formed by the cervix has disappeared, and the mucous membrane of the uterus, and that of the vagina, are found directly continuous without any intervening ridge.

The mucous membrane covering the uterine tumour in chronic inversion has often assumed the external characters of that of the vagina, and its glands mostly disappear (Schröder).

Chronic inversion with prolapsus, of very rare occurrence, may

be accompanied by ulcers, owing to the rubbing and irritation; the mucous membrane gets covered on its surface with layers of pavement epithelium and resembles the skin.

Cases have been mentioned in which the inverted uterus has been eliminated by gangrene; this is a sort of spontaneous cure.

Symptoms.—I shall not speak of acute inversion at the time of delivery, which one cannot fail to recognise if the patient is examined at all carefully.* One should be warned that if this inversion is partial, it may possibly be accompanied by alarming hæmorrhage.

Inversion may take place suddenly in the early days of the puerperium, and be accompanied by violent pain and serious reflex phenomena, such even as syncope. Pain has, however, been absent in some rare cases;† hæmorrhage is not invariably present. If inversion takes place slowly and progressively, as is usually the case with polypi, the symptoms may not be unlike those of simple prolapse; but hæmorrhage is more frequent, and is likely to attract notice. At the same time all the habitual signs of uterine syndroma have been observed: pains, leucorrhœa, reflex symptoms connected with the alimentary canal and the nervous system, and lastly, some phenomena due to pressure on the rectum and the bladder.

The mass formed by the uterine tumour greatly resembles a polypus; but bimanual palpation will enable one to ascertain that the uterus is not behind the pubis, but that it is filling up the vagina.

The signs of inversion may be combined with those of prolapse; cases of this sort are not exceedingly rare.‡

Diagnosis.—Two errors may be committed: one may mistake a simple inversion for a tumour (polypus), or fail to recognise an inversion complicated with a tumour.

Whenever there is supposed to be a polypus presenting a broad pedicle, either one or the other of these troubles has to be

* W. Jaggard (Soc. gyn. de Chicago, Nov. 19, 1886, Anal. in Centr. f. Gyn., 1887, p. 402) has recorded a case where an inversion dating back to the time of delivery was unrecognised, and where the symptoms noticed were attributed to the puerperal state, the physicians having abstained from examining the patient for fear of infecting her!

† Homolle and Martin. Annal. de Gyn., 1875, vol. 3, p. 214.

‡ MacClintock (Diseases of Women, Dublin, 1863, p. 97) has given one example.—Schröder (Mal. des org. gen. de la femme, French Transl., 1886, p. 220) has given another.—F. S. Barber. Case of inversion of the uterus with complete prolapse (Lancet, 1887, vol. 2, p. 660).

dreaded. There are certain positive signs which will enable one to avoid them. The absence of the uterus behind the pubis, to be ascertained by rectal tactus and hypogastric palpation, as well as by passing a sound into the bladder; the presence of a circular pad forming a groove all round the tumour, behind which the sound cannot be passed; and lastly, the possibility, occasionally, of recognising the openings of the tubes: such are the signs of simple inversion.

Inversion accompanying a polypus is more difficult to recognise, and one often finds difficulty in ascertaining what belongs to the one and what belongs to the other. Sensibility of the mucous membrane of the uterus has been mentioned as a characteristic sign, as opposed to the absence of sensibility on the surface of a fibroid tumour (Tillaux, Guéniot, Gosselin). This sign has been disputed,* and it has evidently no pathognomonic value. The greater softness, the deeper colour of the uterine tissue, are only indications of minor importance, as is the degree of consistency ascertained by pricking with a pin. Should there be any doubt left, after carefully examining the parts, under an anæsthetic, I believe it would be the right course to put a provisional elastic ligature on the pedicle, to incise one layer after another of the surface of the tumour to a sufficient depth for one to ascertain that it does not enclose a fibroma. Should one thus penetrate the capsule of a fibroid, it should be enucleated with some blunt instruments, after which an iodoform plug should be introduced, and reduction of the inversion effected. If no result is got from the incision, it should be carefully closed with a continuous suture in superposed layers, or with a series of deep sutures, before removing the ligature used for arresting the hæmorrhage. This exploration would not present much danger, and would make one safe against those mishaps which some surgeons experienced, who, in similar cases, undertook to remove the whole tumour straight away.

Simple prolapsus of the uterus does not take long to be diagnosed; the effacement of the vaginal culs-de-sac, the presence of the os uteri at the summit of the tumour, the possibility

* Leprévost. Irreducible inversion of the uterus, etc. Report of Tillaux (Bull. et Mém. Soc. de Chir., June, 1888, p. 503).—Berger and Ribemont (Annals of hygiene and legal medicine, 1882, vol. 8, p. 321) have stated, from their experience at the Lourcine Hospital, that the mucous membrane of the uterus is, in its normal state, devoid of sensation.

of introducing the sound to what is usually a greatly increased distance, will help one to recognise it; the deviation or the obliteration of the orifice of the cervix, and the co-existence of a fibrous tumour, might cause some doubt. One should bear this contingency in mind.

Prognosis.—This affection, when it has once appeared, generally tends to become aggravated; besides, the patient becomes exhausted owing to the hæmorrhage, the leucorrhœa, and the pain. One should not count too much upon the cases turning out as fortunately as some in which spontaneous reduction has been seen to occur,* nor as some still more exceptional ones which were not devoid of danger, where elimination was produced by gangrene. It must not, however, be ignored that a remarkable tolerance may become established even in very advanced cases.

Treatment.—The more recent the prolapse, the more easily will reduction be effected. Immediately after delivery, when one has ascertained that there is no *débris* of the placenta left behind, the hand should be boldly introduced into the cavity, and the fundus of the organ should be pushed back, whilst the other hand pressing firmly on the abdomen tries to seize it.†

Reduction is much more difficult when one has to do with chronic cases. Yet one should remember that it has been possible to reduce the most obstinate cases. Audigé‡ mentions one which dated back thirty years.

One might divide the methods employed into the forcible and the gentle ones.

Forcible methods.—I shall enumerate them without dwelling upon them at all lengthily, for I believe that they tend to disappear.§ The immense majority of inversions are susceptible of being reduced by mild measures, and as for exceptional cases, for which they are not suitable, they can be dealt with, not by forced taxis, but by removing the organ.

Manual reduction.—The patient is put under chloroform, three

* Spiegelberg. Arch. f. Gyn., 1872, vol. 4, p. 350, and 1873, vol. 5, p. 118.

† R. Teuffel (Centr. f. Gyn., 1888, No. 25, p. 401) mentions that remarkable success has followed this manœuvre, and gives a good figure representing it.

‡ M. Audigé. Contrib. to the study of chronic inversion of the uterus. Thesis for M.D., Paris, 1881, No. 448.

§ These manœuvres always present a certain danger: the vagina has often been torn during efforts at taxis: T.-F. Teale, Chronic inversion of the uterus reduced by taxis; laceration of vagina into Douglas' pouch; recovery (Lancet, 1887, vol. 1, p. 11).

fingers are introduced into the vagina and seize the tumour, the other hand holds the uterus fixed through the abdominal wall, and directs the pressure from above. Two manœuvres have been recommended: reduction *en masse*, by pressing upon the whole of the inverted uterus, and gradual reduction of each horn of the uterus separately (Noeggerath).

Emmet* recommends one to press with the palm of the hand upon the fundus of the uterus, and at the same time to dilate the os with the tips of the fingers. Courty† brings down the uterus with Museaux's forceps, introduces two fingers into the rectum, which he hooks forwards, and keeps the cervix fixed through the wall of the rectum, whilst the thumb and index finger of the other hand press upon the pedicle so as gradually to increase the utero-cervical furrow. Courty occasionally makes two or three longitudinal incisions, starting from the os tincæ and extending along the cervix, so as to divide the circular fibres of the isthmus. Barnes is also in favour of these incisions. Emmet recommends one as soon as the reduction has taken place beyond the os tincæ, to make sure of the result so far obtained by keeping the orifice of the cervix closed with some sutures for several days.

Taxis with instruments.—Viardel's repulser, shaped like a drum-stick, the instrument designed by White (of Buffalo), a sort of cup which grasps the tumour, fixed on a stem consisting of a large elastic spring, which is pressed against the chest of the operator, no longer possess any but historical interest.

Laparotomy and reduction through the peritoneum.—Gaillard Thomas,‡ in presence of the difficulties to be overcome, owing to the constriction of the cervix when one tries to perform reduction through the vagina, performed laparotomy, then dilated the cervical ring with the help of a dilator similar to the instrument used for stretching the fingers of gloves, so as to enable him to push the uterus back through the vagina. He afterwards reduced the uterus with great difficulty; the vagina was perforated and severe hæmorrhage took place. The patient,

* Th. A. Emmet. Principles and practice of gynæc. New York, 1880, pp. 410-438.

† Courty. Practical treatise on dis. of the uterus, 3rd edit., 1881, p. 730.—Chauvel. Bull et Mém. Soc. de chir., 1890, p. 352.

‡ G. Thomas. Diseases of women, 1872, p. 434.

however, recovered, but a second case operated on died from peritonitis. Looking at these facts, I think it rather difficult to agree with a recent author,* who declares that this operation is to be "highly recommended." Even for women who are still young, and likely to have children, hysterectomy seems to me to be preferable to the dangers accompanying such a manœuvre.

Gentle methods.—Rest in bed; hot vaginal douches and massage should be employed as means of diminishing congestion and bringing about a decrease in volume. But continuous pressure upon the tumour is by far the best method of cure. If persisted in, it will overcome almost any case. Hofmeier† never found it to fail.

The means employed have varied. Tylor Smith,‡ soon after imitated by Teale, West, Bockendhal, Courty, &c., was the first to succeed in reducing an inversion of twelve years' standing by continuous pressure with an air pessary. Gariel's pessaries are very suitable for this purpose. They are introduced collapsed, and then they are blown out as much as possible. Their action appears to be a complex one: pressure on the tumour produces diminution of its volume; constant contact with the cervix makes it lax; lastly, the uterine fibres being excited by the reducing action of the pessary, may set up contractions, the efficacy of which may be ensured by pressure exerted above and below. In other countries a frequent use is made of an india-rubber bag filled with water, called a colpeurynter.§

Reduction may be delayed a month and more; it is generally preceded by violent pains.

A stem-pessary, shaped as a cup and provided with two elastic bands, which are to be fixed to an abdominal belt, has been greatly praised by Thomas, Barnes, Duncan, Aveling, &c. It is a dangerous means, which may cause some ulceration.

* G. Bouilly. Internat. Encyclop. of surgery. French edit., vol. 7, p. 689.—Mundé (Laparotomy for reduction of an inverted uterus, in Amer. Journ. of Obstet., 1888, vol. 21, p. 1279), after having vainly tried to reduce a case of chronic inversion, determined to perform laparotomy to try and dilate, from above, the constricting ring, according to Thomas' method. Not having succeeded he resorted to castration, then to removal of the uterus by the elastic ligature. Cure followed.

† M. Hofmeier. Grundriss der gynäk. Operat., 2nd edit., 1892, p. 281.

‡ Tylor Smith. Med. Times and Gazet., 24th April, 1858, vol. 1, p. 437.

§ B. Campbell Gowan (Lancet, Sept. 21, 1889, p. 598) has described a new hydrostatic bag for reducing chronic inversion; it is fixed to a belt by means of a T bandage.

A plug made of iodoform gauze* is much to be preferred, its application being simple, easy, and not requiring the use of any special instrument. It should be renewed every two or three days with the greatest care, long strips of gauze two inches thick being employed, and gradually heaped up around and above the tumour; a certain amount of force should be used. The patient has to be kept in the horizontal position. During the whole course of the treatment the bowels should be kept open by enemata, and if there is any difficulty in micturition, the catheter should be used regularly.

The account of the methods that were employed before the days of antiseptics for excising an inverted uterus would be both long and wearisome; they include the earliest cases of hysterectomy.†

Amputation by means of a lineal écraseur‡ is a proceeding to be discarded; it is very slow, gives rise to most violent pains, does not prevent hæmorrhage, and is liable to injure the neighbouring viscera.

Removal by incision, following immediately upon the application of a ligature§ or a clamp,‖ division with the galvano-caustic wire, gradual ligaturing either with steel wires, or with slowly contracting caoutchouc tubes, after a furrow has been made with the thermo-cautery (Courty), are all out of date methods which should be given up, although when properly employed, good results may be got from them.¶

* Barsony (Centr. f. gyn., 1890, p. 502) introduces tampons into the vaginal culs-de-sac before employing the colpeurynter.—Kocks (ibid., p. 658) has, it seems, spoken in favour of this practice some ten years ago.

† Two curious examples are found in F. Rousset's celebrated work, "Cæsarei partus assertio historiologicæ," Paris, 1590, p. 332. He performed the section after previously ligaturing and using the actual cautery. One of the cases, which belonged to Rousset, took place in the year 1533. The two women recovered. I collected a large number of instances of this sort in my thesis for the license, "On the value of hysterectomy," 1875, p. 149.—See also Denucé. "Treatise on inversion of the uterus." Paris, 1883.

‡ Aran, *loc. cit.*, p. 914.—MacClintock, *loc. cit.*, p. 85.—Sims, *loc. cit.*, p. 155.—V. Faucon. On a special kind of polypous inversion of the uterus, supra-lateral inversion, amputated by the lineal écraseur with a suture (Bull. de l'Acad. roy. de Belgique, 1887, pp. 723-738.

§ Palasciano. Mentioned by Courty, *loc. cit.*, p. 736.

‖ Valette (of Lyons). Lyon méd., April 1871, vol. 7, p. 342.

¶ Le Fort. Uterine inversion. Elastic ligature. Cure (Bull. et Mém. Soc. de Chir., 1887, vol. 13, p. 201). A caoutchouc thread was rolled seven or eight times round the pedicle; a ligature of common thread was rolled several times round it just below. No excision of the tumour; the ligature fell off after thirteen days. Cure followed.

A notable improvement in the application of the gradual ligature was introduced by Périer,* consisting of his method of ligature by elastic traction with the help of a "special serre-nœud" with a rack; it may be of use to any surgeon who is not familiar with the method of performing vaginal hysterectomy.

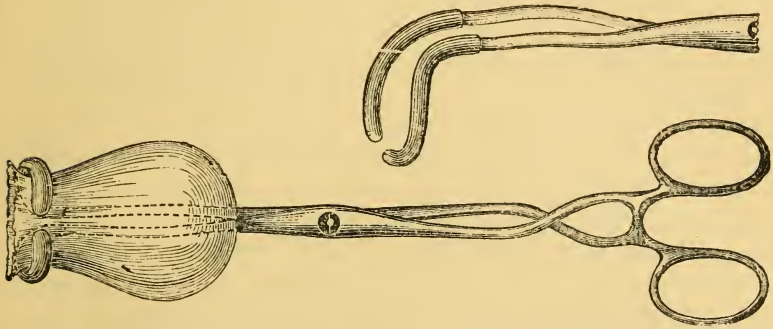

Fig. 301.—Forceps with semi-circular blades covered with caoutchouc for seizing hold of the inverted uterus (Périer).

Instead of applying the elastic ligature immediately upon the point to be cut through, Périer ties the uterus very tightly with a strong silken thread, and it is upon this thread that the elastic

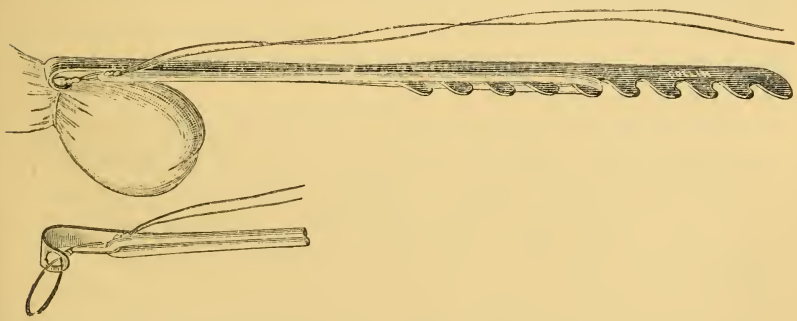

Fig. 302.—Metal stem with rack to be used as a lever for placing an elastic ligature on the inverted uterus (Périer).

traction is exerted, by means of a caoutchouc ring. The constricting band is thus continually being tightened and gets more and more drawn into a hole made in the end of a metal stem, which is used as a lever for the traction. This stem, which has

* Périer. Bull. et Mém. Soc. de Chir., June 16, 1880, p. 379.—On ligature with elastic traction, applied to the treatment of inversion of the uterus (Revue de chir., Dec., 1886, p. 969).—Le Fort, *loc. cit.*—Leprévost, *loc. cit.*, p. 503.

a certain number of notches forming a sort of rack at its lower end, presents so many successive points from which the traction upon the caoutchouc ring may be exerted.

The following are the instruments required: forceps for bringing down the uterus (fig. 301); a metal stem with a rack (fig. 302); a piece of strong silk thread; a caoutchouc ring; a hook, for which an ordinary button-hook may be substituted.

First stage.—The uterus is brought out externally, with the help of a pair of forceps, and the inversion is rendered complete, should it happen to be incomplete.

Second stage.—A loop of very stout thread is passed round the uterus, immediately above the teeth of the forceps. The two ends of the thread are passed through the eye of the metal stem, the extremity of which comes in contact with the uterus. One can then see whether the thread is properly applied to the point where one desires to produce the constriction, which has to be brought to an extreme, by making the knot as tight as possible.

Third stage.—A caoutchouc ring is held against the constricting knot by means of another knot which must invariably be made treble, since it has to support the caoutchouc and would be sure to become loosened, owing to the traction, and slip off, if it were merely double.

Fourth stage.—A hook is used to hold the free part of the caoutchouc ring, and to fasten it as far off as possible to one of the notches in the rack.

Fifth stage.—The uterus has to be replaced in the position it occupied in the vagina, and the free end of the stem comes out of the vagina, without exerting any pressure upon the soft parts. This stem keeps upright in the axis of the vagina owing to the direction in which the traction is exerted. The following days, the caoutchouc ring may be hooked into one of the notches situated lower down, and antiseptic vaginal injections should be persevered with. The uterus becomes separated between the ninth and the fourteenth day, in the shape of a small shrivelled-up mass, hardly to be recognised.

Kaltenbach * has spoken in favour of the immediate amputa-

* Hegar and Kaltenbach. Die oper. Gynäk., edit. 3, 1886, p. 575.—Hicguet (Bull. de l'Acad. roy. de Belgique, 1885, p. 500) has published one successful case obtained with the double elastic ligature, followed by excision with the thermo-cautery.—Goossens, of Rotterdam (Centr. f. Gyn., 1887, No. 37, p. 598), has amputated the uterus below an elastic ligature. Cure followed.

tion of the inverted portion, with some cutting instrument, after applying a provisional elastic ligature. For more safety, and to guard against the possible slipping of the elastic ligature, the two peritoneal surfaces may be united by a series of deep sutures, passing obliquely under the whole bleeding section of the stump, so as to compress the vessels at the same time. A dressing of gauze containing iodoform or perchloride of mercury will keep the stump aseptic; it becomes detached about the third week. The two folds of peritoneum now become glued together, and as no vagino-peritoneal fistula remains, one need have no fear of extra-uterine fecundation taking place. If the pedicle is very large, one should apply a double elastic ligature by transfixion.

The rules for the performance of total vaginal hysterectomy are at the present moment so well defined, and the results obtained from it are so satisfactory, that I should not for my own part have any hesitation in resorting to it, rather than to amputation of the inverted portion, if I could not see the possibility of producing reduction.

BOOK VII.

ON THE MALFORMATION OF THE CERVIX UTERI. ATRESIA.—STENOSIS.—ATROPHY.—HYPERTROPHY.

ATRESIA OF THE CERVIX.

DEFINITION.—ETIOLOGY.—TREATMENT.

Atresia means the imperforation or the occlusion of the os tincæ.

Congenital atresia * most often accompanies other more important affections, such as double uterus and vagina and atrophy of one of the two genital canals. The hematometra and hematocolpos which result from it ought to be studied with the general history of the malformations of the genital organs.

One ought, theoretically, to give here a description of those rare but unquestionable cases, in which the only congenital lesion seems to consist in the imperforate cervix, on a level with either its internal or its external orifice.† But the clinical consequences of this anomaly are identical with those resulting from the absence of development of the upper portion of the vagina, and I shall not expose myself to useless repetitions.

Acquired atresia ‡ is consecutive to lacerations following

* P. Müller. Die Sterilität der Ehe. Entwicklungsfehler des uterus. Stuttgard, 1885, p. 216, *et seq.*—A. Breisky. Krank. der Vagina, in Deutsche Chir., Stuttgard, 1886, p. 58.

† G. Lowe. Case of atresia of the uterine cervical canal; distension of the uterus; escape of the menstrual fluid between the walls of the vagina. (Obstet. Trans., London, 1887, vol. 24, p. 401.)

‡ W. A. Meredith. A case of hæmatometra associated with a degenerating fibromyoma, &c. (Obstet. Trans., London, 2nd Nov., 1887, vol. 29, p. 422.)—Dubreuil. Hæmatometra (Rev. de Chir., Aug., 1889, p. 677).—Chiarleoni. Ematometra per chiusura acquisita del muso di tancia (Gazz. di osp., Milan, 1888, vol. 9, p. 139).—W. S. A. Griffith. Pyometra (Obstr. Trans., London, 1887, vol. 29, p. 398).

delivery, to cicatrices formed by any excessive cauterisation which has acted upon the periphery of the cervix, to amputations performed by any method which has not resulted in lining the orifice with the mucous membrane and has given rise to a concentric retraction of the tissues. It may also follow the cicatrisation of any ulceration of the cervix, accompanying senile atrophy of the uterus; lastly, it may be due to the presence of tumours in the cavity of the cervix or in the inferior portion of the body in old women. Atresia is also to be found in prolapse of the uterus, owing to the friction exerted upon the os tincæ by a pessary, or merely to the irritation produced by the rubbing when the organ protrudes externally. Apart from all these causes it may come on spontaneously as age advances. Lastly, certain cases have been mentioned of atresia coming on during the course of pregnancy,* but they seem doubtful to me.

The results of this obliteration vary according to whether the patient has not yet reached, or has passed beyond the menopause. In the first case, such serious complications as hæmatometra and hæmato-salpinx are to be dreaded (see for their description the chapter on malformations). In the second case, the lesion generally passes unnoticed, unless some cause for septic irritation exists in the interior of the uterine cavity, and gives rise to an accumulation of pus (pyometra), or of gas (physometra). I have observed two examples of pyometra in cases of cancer of the body of the uterus, and of inflamed fibroid tumours in old women.

The treatment then consists in re-establishing the opening in the cervix by making incisions and using the sound, and if necessary by disinfecting the uterine cavity, then by seeing to any other accompanying lesion, such as a fibroid or a cancer.

Stenosis of the Cervix.

Etiology and morbid anatomy.—Symptoms. Dysmenorrhœa. Metritis. Sterility.-Diagnosis: external orifice; internal orifice.—Prognosis.—Treatment. Gradual dilatation. Discision of the external orifice and of the internal orifice. Electrolysis. Amputation of the cervix by stomatoplasty.

Stenosis is the narrowing of the cervix; it is the obstructive dysmenorrhœa of English authors.

It may be congenital or acquired.

* Edis. Diseases of women, London, 1882, p. 33.

When it is congenital, it is generally found accompanying a conical cervix, sometimes with hypertrophy, which is often in an inverse ratio to the want of development of the body.

The cervix, pointed somewhat like a sugar-loaf, is very firm

Fig. 303.—Stenosis of the cervix.

Normal orifice and pin-point orifice, seen with the aid of the speculum.

in consistence, and at its summit is a small orifice which looks as if it had been pierced with a needle (fig. 303). The anterior lip is often somewhat prominent, presenting the appearance of a sort of hypospadias of the cervix, or even of a small trunk

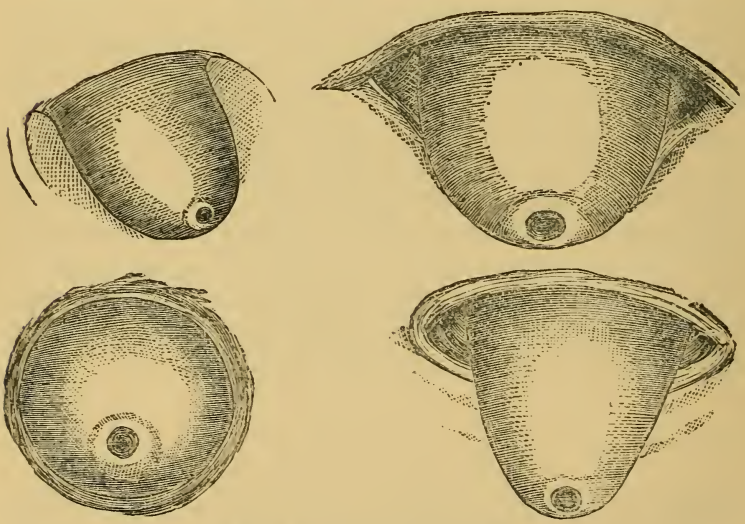

Fig. 304.—Stenosis of the cervix.

Various forms of conical cervix.

(tapiroid cervix). The stenosis then frequently coincides with congenital hypertrophy of the os tincæ (fig. 304).

Congenital stenosis may be merely the consequence of a cervico-corporeal anteflexion closing up the cervical canal.

The causes of acquired stenosis are the same as those of atresia. One important consequence of this lesion is that there is difficulty in getting rid of the cervical mucus, and that as a result of its stagnation it induces dilatation of the cervix; this dilatation is very soon complicated with inflammation of the mucous membrane, and the secondary lesion before long plays the principal part, while increasing in its turn the abundance and viscosity of the mucus (fig. 305).

Symptoms.—Examination with the speculum and the passing of the sound leave no doubt about the existence of this lesion;

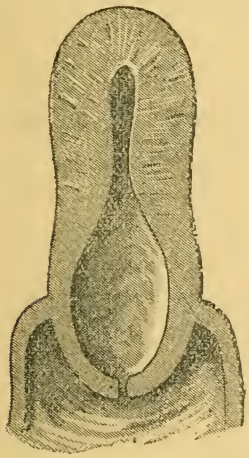

Fig. 305.—Stenosis of the cervix (external orifice).

Dilatation of the cavity of the cervix owing to retention of the mucus in a case of cervical metritis, with narrowing of the external orifice.

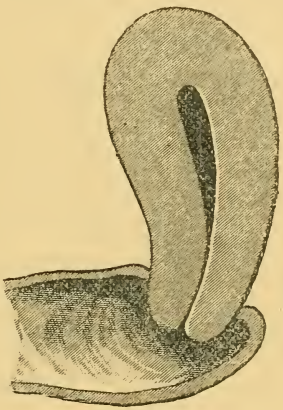

Fig. 306.—Stenosis of the cervix (cervical canal).

Uterus with narrow cervical canal, without any flexion of the cervix (a typical case for Simpson's operation).

having once passed the shrunken orifice, one often penetrates into an ampulla formed by the dilated cervix.

Dysmenorrhœa and sterility are the two most important symptoms. One should, however, observe that dsymenorrhœa is at times absent in women who are obviously affected with narrowing of the cervix.

The pain during the menstrual periods has its seat principally in the lumbar, iliac, and sacral regions; it is like colic, coming on in paroxysms, when the flow of blood has been too abundant to pass through the narrowed canal, or when the latter is blocked

up by a clot; short periods of respite are also observed after small quantities of blood have been cleared away. The pains are so intense, that occasionally the patients suffer from nervous attacks, syncope, uncontrollable vomiting, and these attacks are often followed by extreme prostration.

These patients are generally chlorotic, dyspeptic, and neuropathic.

Metritis is a frequent consequence of this difficulty in evacuating the mucus and blood proceeding from the uterine cavity; the signs of uterine syndroma persist during the intervals between the menses, and thus join the acute periods one to another. Thus

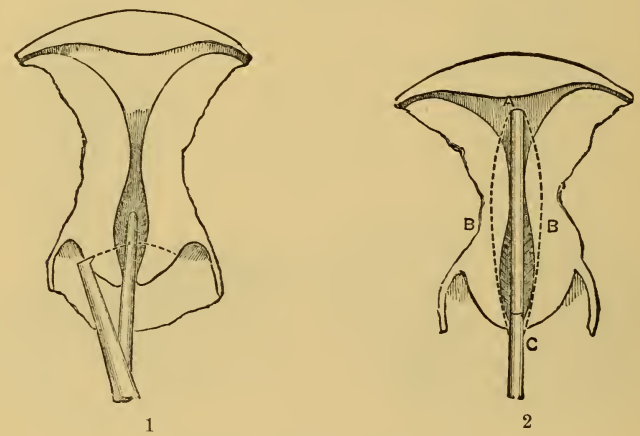

Fig. 307.—Incision of the cervix.

1, Incision of the external orifice with Küchenmeister's scissors; 2, Incision of the internal orifice with a double metrotome. The curve A B C indicates the section obtained when the blades are separated.

is constituted one of the most frequent forms of metritis in the virgin.

Sterility is a consequence of stenosis of the cervix, although, after what Sims has said, its influence from that point of view has been no doubt exaggerated. It is not so much through the mechanical obstruction opposed to the entrance of the spermatic fluid that the deformity produces this effect; however narrow the passage, it would still be sufficient. It is rather to the channel being blocked-up with mucus that one may attribute the sterility. Normally, during coitus, the cervix, under the influence of the erethismus, which Rouget has compared to a true erection, expels

the mucus it contains.* In its place, some vaginal mucus mixed with sperm† penetrates the cavity, either from a sort of aspiring action resulting from the venereal orgasm having ceased, or simply from the effect of capillary attraction; this exchange is absolutely prevented by the narrowness of the external orifice, which opposes a thick plug of acid mucus to the entrance of any spermatic fluid.

Diagnosis.—The only interesting and important detail to be seen to, is to ascertain the exact situation of the maximum of narrowing. When the cervix presents a conical appearance with a pin-point orifice, hidden by a small drop of viscous matter which one might compare to some of the mucus spat up from the larynx, there is no doubt about the external orifice being one of the sources of the trouble. But it may not be the only one; according to Bennett's very just remark, there is another passage above the cervix where narrowing may take place (fig. 306).

Might not the stenosis of the internal orifice be due to contraction, as has been maintained? It is doubtful. I believe it to be the result of imperfect development, with or without congenital anteflexion. I only wish to mention in passing such a thing as acquired stenosis following excessive cauterisation; it is much less frequent in that situation than at the external orifice.

One must not be in a hurry to jump to the conclusion that there is narrowing of the internal orifice, because the sound will not pass easily up to that point. One ought to make certain that the obstruction is not due to the tip of the sound getting caught in a fold of mucous membrane, or coming in contact with the angle of flexion. For this, one should alter the bend of the sound, according to what one presumes to be the direction of the cervico-uterine cavity, the handle should be properly lowered towards the fourchette, the posterior lip of the cervix should, if necessary, be fixed or dragged downwards, if one is dealing with an anteflexion, the anterior lip being dealt with in the same way if it is a retro-deviation. It is only after groping about carefully for some time that any diagnosis can be settled upon.

Prognosis.—Stenosis of the cervix of congenital origin, which

* Kristeller. Berl. klin. Woch., 1871, Nos. 27 and 28, pp. 315 and 325.
† Beck. Amer. Journ. of Obstetr., 1874, vol. 7, p. 353.

is incomparably the most frequent, disappears for good after fecundation and delivery have taken place, not so much owing to the forcible and excessive dilatation to which the cervix is then subjected, as to the change which takes place in the structure of the entire uterus during pregnancy. The object of the surgeon should therefore be to favour fecundation, and he should merely regard the various means of artificial dilatation as palliative measures.

Treatment.—But little good has resulted from dilatation performed slowly with the laminaria tent, or quickly with graduated bougies; some advantage may however be derived from using it regularly before each menstrual period. For my part I prefer Hegar's dilating bougies, and I consider that passing them frequently may have a favourable effect by acting as a stimulus to the vitality of organs which are more or less incompletely developed, and which are generally the ones in which one finds congenital cervical stenosis.*

For section of the external orifice with some cutting instrument one may use either a scalpel, a pair of strong scissors, a pair of special scissors provided with a hook to prevent any slipping (Küchenmeister's scissors), or one of the various metrotomes which have been suggested since the time when Simpson † first spoke in favour of this operation in England, and invented an instrument analogous to Dupuytren's lithotome.

Later on Marion Sims,‡ in America, had a great deal to do with making the operation more common, and it became so much the fashion that one has difficulty in realising it at the present day, if one considers it from a purely scientific point of view. Since then gynæcology has passed through a period not yet come to an end in all quarters, when the removal of the constriction in the internal and external uterine orifices by incision has been practised, especially in other countries, to quite an excess. There was hardly a newly-married woman who delayed

* See, for the technics of dilatation, p. 115.—One should not look upon this small operation as insignificant, and the greatest antiseptic precautions should be taken. One has heard of several cases with serious complications, and a still greater number have undoubtedly not been published. T. C. Smith. Accidents from the use of laminaria tents (Amer. Journ. of Obstet., 1888, p. 694).—C. C. Lee. Dilatation of the cervix; septic peritonitis; death (ibid., p. 498).

† J. Y. Simpson. Med. Times and Gazette, Feb. and March, 1859, and Selected obstet. works, London, 1871, p. 677.

‡ M. Sims. Lancet, 1865, vol. 1, p. 224, *et seq.*—Uterine surgery, London, 1865.

at all in having a child, or any young or old one with pains at the menstrual period, who was not found to be a proper subject for this operation. However insignificant it may seem, it has been followed several times by fatal results, especially before the days of antiseptics.

One has to separate from the section affecting the external orifice (which may be median, posterior, bilateral, or multiple) the section which goes deeply through the internal orifice and the whole length of the cervical canal (fig. 308). A probe-pointed bistoury may be used to make the incisions, after the cervix has been fixed and slightly lowered so as to be within reach of a valve-speculum. This is a much more serious operation than the preceding one.

To stop the hæmorrhage, the incision should be gently plugged

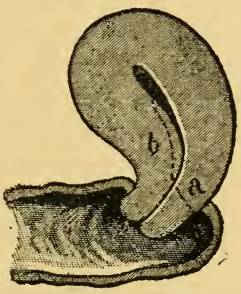

Fig. 308.—Stenosis of the cervix (cervical canal).—Lines of incision at the level of the internal os; *a*, incision of the external orifice at the posterior lip; *b*, incision of the internal orifice through the anterior wall.

with some pledgets of cotton-wool soaked in perchloride of iron, to be withdrawn the next day. The patient ought to be kept in bed for three days. A small pessary with an elastic stem (Barnes), or a glass peg (Thomas) is kept in the cervix for several days.*

I shall not give any further description of these operations, because I look upon them as bad. The incisions of the external orifice become cicatrised and the deformity is reproduced, or they remain gaping and give rise to ectropion of the mucous

* Consult on this subject: Marion Sims, On the surgical treatment of stenosis of the cervix uteri (Amer. gyn. Trans., 1878, p. 54).—Thomas, Diseases of Women, London, 1880, p. 615.—Barnes. Dis. of women, London, 1878, p. 245.—Munde, Minor surg. gynæcology, New York, 1885, p. 297.—Heyder. Zur Behandlung der Stenose des Uterus (Zeitschr. f. Geb. u. Gyn., 1887, vol. 14, p. 259).

membrane, and so perpetuate the cervical catarrh. As for the deep incisions, they are not without danger, for, whatever amount of care is taken to regulate the action of the metrotome, this instrument, which one can only use blindly, may go beyond the limits which one has in one's mind, and so give rise to serious complications. I therefore prefer using the probe-pointed bistoury, which one can be perfect master of.

Dilatation of the cervix by the various methods either causing or not causing bleeding, may give some excellent results in one particular class of patients; it is in cases of slightly marked stenosis accompanied by reflex nervous phenomena out of all proportion with the lesion. Two theories have even been propounded on this subject. Schauta, who extols section with a cutting instrument, maintains that he has thus cured certain nervous affections of a hysterical character, which he attributes to dividing certain nervous filaments; he declares that in such a case dilatation by the bloodless method fails completely.* On the other hand, Doléris extols forcible dilatation of the cervix in the same circumstances; it is analogous in its action to nerve-stretching.† I believe that in both these kinds of dilatation, the relief so rapidly afforded to the patient may be explained much more simply, by the easier flow of the mucous secretions which before were retained; a constant source of reflex actions thus ceases to exist. Not only are the pains, but the gastric symptoms are thus soon put right.‡

Electrolysis§ has been much extolled of late. The advantages which it is said to have are: harmlessness, absence of pain, efficacy, due to the sloughing produced by the fluid-forming pole leaving a soft and tensile cicatrix like the ones produced by

* Schauta. Zur gynäkologischen Behandlung der Neurosen (Wien. med. Blätter. May 27, 1886).

† Doléris. Nouv. Arch. d'obst. et de gyn., 1887, vol. 2, p. 33.

‡ J. W. Farlow. Menorrhagia and chronic dyspepsia of two years' standing cured by dilatation of the cervix uteri (Boston med. and surg. Journ., 1883, vol. 109, p. 296). Boissarie. On uncontrollable vomiting not connected with pregnancy; on dilatation of the cervix (Annal. de gyn., Oct. 1887, vol. 28, p. 284). The surgeon de Sarlat declares that he took as his authority a work of Copeman's, published in the Brit. med. Journ., and analysed in the Annal. de Gyn., Nov., 1878, where uncontrollable vomiting of pregnancy ceased after dilatation of the cervix with the finger.

§ Leblond. Annal de gyn., 1878, vol. 9, p. 339.—Henry Fry. The relative merits of electrolysis and rapid dilatation in the treatment of sterility and dysmenorrhœa (Amer. Journ. of Obstet., 1888, vol. 21, p. 40).—See a discussion on the subject before the Obstet. and Gynæcol. Soc. of Washington (ibid., p. 78).

the caustic alkalies. The currents which have been recommended for this are the very feeble ones requiring very long sittings.

In cases where the stenosis of the cervix is not very great, what I prefer to this rather complicated method is the progressive immediate dilatation with Hegar's bougies (after the cervix has been softened with a laminaria tent). With this manœuvre I combine, if need be, some very small incisions into the periphery of the orifice of the os tincæ, by means of a blunt-ended tenotomy knife, so as to facilitate the passage of a small laminaria tent.

In very marked cases of stenosis, the only rational operation seems to me to consist in an autoplastic re-establishment of a sufficient orifice for the os tincæ, with the help of a stomatoplasty. This operation does not act upon the formation of the external orifice only, as one might think. Owing to the deeper changes brought about in the cervix, the upper part of this canal becomes, as I have myself been able to ascertain, much more permeable. It acts, besides, in destroying the cervico-corporeal flexion, the spur of which frequently gives the notion of there being some narrowing higher up. I believe, therefore, that after doing this operation, one should wait a little while before dealing with the stenosis seated above and observed during some previous examination. One may find out, later on, that this obstacle has disappeared; should it still exist, progressive dilatation with Hegar's bougies is infinitely preferable to making an incision. The passing of the first bougies should be facilitated by lightly scarifying the inner part with a tenotomy knife; but this can in no way be compared to the deep incisions of Simpson, Sims, &c.

Stomatoplasty is after all nothing else but an amputation of the cervix. I have described the details of the operation in the chapter on "The Treatment of Metritis" (p. 223). I shall not refer to it again. One or the other of the methods I have explained may be chosen, according to the case. Should one be dealing with a thick, fleshy cervix, one ought to have recourse to the biconical excision with two flaps (Simon-Markwald). If the mucous membrane is obviously much altered, one should rather adopt the method where one flap is formed, excision of the mucous membrane being performed (Schröder). I have sometimes combined these two methods, in cases where the

cervix is of the tapiroid variety, making two flaps in the anterior lip so as to remove a more considerable cuneiform segment, and one single flap in the posterior lip. Whatever the case, the object which one should, before all things, have in view, is to re-establish an orifice, transverse in shape and of sufficient dimensions, well covered with mucous membrane, so that nothing in the way of retraction or shrinking can take place after the operation.

Congenital Atrophy of the Cervix and Uterus.

Ætiology and pathological anatomy.—Symptoms and diagnosis.—Treatment.

There exists a kind of atrophy, which is called congenital, but which it would be much better to call atrophy from congenital predisposition, or simply atrophy from retarded evolution. The uterus may, after birth, undergo, not an arrest of development as during fœtal life (an arrest which would constitute a malformation by the excess or default of some part or other of the womb) but rather a general slowness of evolution; without any alteration in type this slackening of evolution leaves to the adult uterus the dimensions of a child's uterus. The whole organ is small, its walls are thin, but the relative proportions of the cervix and body are normal, and this distinguishes it from the fœtal uterus. Puech has called this variety the "pubescent uterus," to show that it preserves the dimensions usual at the commencement of puberty; Virchow has given it the name of "hypoplasia of the womb." As a rule the other internal and external generative organs are similarly atrophied.

The weight of the pubescent uterus, according to Puech,* is less than that of the normal virgin uterus; it averages 27 grammes instead of 45 grammes.

This infantile condition of the genitals sometimes coincides in women (as also is the case in men) with a retardation of the whole development of the individual, and we may find young women over twenty years of age bearing the figure and the appearance of children before puberty. At other times the atrophy is limited to the sexual organs, and nothing external

* Puech. Annal. de Gyn., 1874, vol. 1, p. 278.

reveals the condition beyond a greater narrowness of the pelvis than normal. For there is an intimate relation between the condition of this portion of the skeleton and that of the internal generative organs; in mathematical language we might say that the pelvis is a "function" of the uterus. Exceptions to this rule are rare.

Atrophy must be attributed to some congenital predisposition of obscure origin. It has been said that it is sometimes dependent upon chlorosis and tuberculosis. The opposite seems to me nearer the truth; women who are the subjects of this malformation have a more or less altered nervous system, and a very precarious general nutrition owing to the very fact of this condition of the generative organs.

Symptoms and diagnosis.—Complete or nearly complete amenorrhœa is the first symptom to attract attention. The menstrual nixus may even be absent, and the young woman be absolutely without sex from a physiological point of view. If menstruation appear it is accompanied by dysmenorrhœa and grave nervous phenomena. A certain proportion of these patients have hereditary tendencies with regard to their nervous system, and belong to the class that alienists call the feeble-minded (les dégénérés); intelligence is impaired, and there are outbreaks of hysteria or of epilepsy. That, however, is not the general rule; another class of women with pubescent uterus is on the contrary endowed with a robust constitution in all other respects.

Local examination reveals a small cervix with a very small os; bimanual palpation, rectal examination, and passage of the sound show atrophy of the uterus itself; the external genitals are ordinarily but little developed, and the vagina is shorter than normal.

The normal proportions of the cervix in the pubescent uterus differentiate it from the fœtal or infantile* uterus in which the cervix is greatly developed while the body is atrophied.

Treatment.—Attention must first be turned to the general health; tonics, good food, hydro-therapeutics, a stay at the sea-side, will improve the patient's health and favour her growth. With regard to local treatment it is almost useless. It ha

* This term must not be taken wrongly; it is derived from *infans*, which properly means a fœtus at term.

been recommended to excite the uterus by pessaries with a galvanic stem (iron and copper) which can give rise to weak electrical currents and act as a local stimulus. It is a method which is not free from difficulties, nor even from dangers, while its efficaciousness is very problematical. It would be more rational to employ direct electrical treatment by means of continuous currents. Lastly, symptomatic treatment for the relief of the dysmennorhœic troubles must be insisted upon; if they, and the nervous symptoms which accompany them, are really serious, there would be some justification for the belief that the development of the ovaries is exaggerated relatively to that of the uterus, and if this be verified by an examination under chloroform, castration would be indicated.*

Acquired Atrophy or Super-involution of the Cervix and Uterus.†

Pathological Anatomy.—Ætiology. Senile atrophy. Post-puerperal super-involution. Various causes.—Symptoms and diagnosis.—Prognosis and treatment.

Pathological anatomy and ætiology.—Normally, the termination of the generative life in the female is marked by a diminution in size of the uterus, which proceeds progressively with age, so that in very old women the uterus may be reduced to minimal proportions, so long as it do not contain fibrous nodules, which is very common.

Senile atrophy is brought to bear both on the body and on the cervix, and the latter is often nothing more than a shapeless stump, or may even have disappeared, so that nothing is found but an opening at the inner end of the vagina. This condition is especially likely to be seen in women who have borne many children.

Sometimes an analogous process occurs prematurely, before the normal age for the menopause, and then it is after a confinement whereby the whole vitality of the uterus seems to have been suddenly exhausted. In these cases normal involution

* M. Stauch. Zur Kastration wegen funktionirender Ovarien bei rudimentären Entwickelung der Müller'schen Gänge (Zeitschr. f. Geb. u. Gyn., 1888, vol. 15, p. 138).

† On the whole of this subject Wilhelm Thorn's important paper "Beitrag zur Lehre von der Atrophie Uteri" (Zeitschr. f. Geb. u. Gyn., 1889, vol. 16, part 1, p. 57) may be consulted with advantage.

may be said to have exceeded bounds, and to have proceeded beyond physiological limits. Simpson * found this atrophy in about 1·5 per cent. of cases after delivery, and Frommel † in 1 per cent. But it must be noted that this super-involution is sometimes only transitory.

Amongst the causes of super-involution Frommel counts especially prolonged lactation.‡ Considerable losses of blood during delivery seem also to have a real effect. In a word, the same may be said of every debilitating and predisposing cause: tuberculosis, chlorosis, syphilis, diabetes,§ Bright's disease, the morphia habit,‖ Grave's disease,¶ &c. Diseases of the generative organs sometimes terminate by producing uterine atrophy: metritis, oophoro-salpingitis may end therein.

Pelvic peritonitis during the puerperal state, or better, the septic peri-oophoro-salpingitis that may follow upon delivery and miscarriage, by producing sclerosis of the ovary, may also be a cause of premature menopause and super-involution.

Lastly, I have remarked that the diminution of the size of the uterus, which has been well shown by C. Braun to follow upon amputation of the cervix, may go so far as to produce atrophy of the womb. In an old woman affected with prolapse, on whom I performed conoid amputation of the cervix by Huguier's method five years ago, the uterine body now is only the size of a hazel-nut. In a young woman in whom I excised the cervical mucous membrane for an intense endo-cervicitis, the uterus temporarily diminished in size to an extreme degree, but afterwards returned to its normal condition.

* J. Y. Simpson. Superinvolution of the uterus (Edinb. med. Journ., May, 1883, vol. 28, p. 960).

† Frommel. Ueber puerperale Atrophie des Uterus (Zeitschr. f. Geb. u. Gyn., 1882, vol. 7, p. 305).

‡ Gottschalk. Ein Fall hochgrädiger Galactorrhœa, complicirt mit Atrophia Uteri acquisita. Heilung durch Skarifikation der Vaginalportion (Deut. med. Zeit., 1887, vol. 8, p. 913).

§ Hofmeier. Berl. Klin. Woch., 1883, No. 42, p. 641.—Cohn. Zeitschr. f. Geb. u. Gyn., 1888, vol. 14, part 1, p. 194.—Lecorché. Diabetes mellitus in women, Paris, 1886, p. 171.—A. Nebel. Kasuistischer Beitrag zur Atrophie der weibl. Genitalien bei Diabetes mellitus (Centr. f. Gyn., 1888, No. 31, p. 499).

‖ Levinstein. Frühzeitige Atrophie des gesammten Genitalapparates in einem Fall. von Morphium-Missbrauch (Centr. f. Gyn., 1887, Nos. 40 and 52, pp. 633 and 841).

¶ L. Kleinwächter (Zeitschr. f. Geb. u. Gyn., 1889, vol. 16, sect. 1, p. 145) says it is constant.—Sänger (Leipzig Obst. Soc., May 20, 1889, in Centr. f. Gyn., 1890, p. 133) has not always met with it.

Removal of the ovaries is also a cause of atrophy of the uterus, and some surgeons * have not hesitated, in consequence, to perform castration for the cure of chronic painful metritis.

In cases of senile atrophy the uterine tissue is sclerosed, in post-puerperal super-involution it may be soft and friable, in consequence of incomplete absorption of the fatty materials that arise from disintegration of the muscular fibres.†

Symptoms and diagnosis.—Cessation of menstruation and diminution in size of the cervix and of the body, determined by the various methods of examination, alone constitute the clinical symptoms. The greatest care must be observed in passing the sound in cases of post-puerperal atrophy, as the walls of the organ may be much thinned; in cases of senile atrophy the sound will only enter 5 or 6 cm., while in cases of puerperal super-involution the cavity is of normal size and may even appear to be increased, owing to the possibility of depressing the uterine tissues.

Prognosis and treatment.—Post-puerperal super-involution may be only temporary, and numerous observations prove that impregnation and pregnancy may afterwards supervene. A return to activity of the uterus should be encouraged by general tonics, hydro-therapeutic treatment, salt-water baths, intra-uterine electrical treatment, and a local excitation produced by warm injections and the frequently-repeated passage of the sound. I should prefer these methods to the use of a pessary with a galvanic or elastic stem, which, in its *rôle* of a foreign body, seems to me likely to be more harmful than useful. Peri-metritic inflammation due to their use has often been noticed.

Hypertrophy of the Supra-Vaginal Cervix.

Hypertrophy may affect the supra-vaginal or the infra-vaginal portion of the cervix. I have already described the former when dealing with the subject of prolapse of the generative organs, which it frequently accompanies. I refer the reader therefore to that chapter on this part of the subject.

* Kelly. Removal of ovaries and tubes for sub-involution and chronic metritis (Amer. Journ. Obstet., 1887, vol. 20, p. 180).

† J. M. Klob. Path. Anat. der weibl. Sexualorgane, Vienna, 1864, p. 205.

Polaillon* has reported a case in which not only the supra-vaginal cervix, but also the body of the uterus, had undergone gigantic hypertrophy; the uterus filled the whole abdomen, without any alteration in shape and without any tumour being present. These exceptional cases of gigantic hypertrophy of the uterus could not be confounded with supra-vaginal hypertrophy of the cervix. Hypertrophy secondary to the presence of a fibroid, or "fibroid pregnancy," would also be recognised by means of the special symptoms that it presents. The only feature common to all these cases is the abnormal depth to which the sound can be introduced.

Hypertrophy of the Infra-Vaginal Cervix.

Ætiology and pathological anatomy.—I shall not stop long to describe here acquired hypertrophy secondary to metritis, for it has already been considered. I shall just recall to mind that it may take on two forms: follicular hypertrophy, bearing especially upon the mucous membrane, which becomes infiltrated by glands of new formation that have undergone more or less cystic transformation; and fibro-cystic hypertrophy, in which the parenchyma of the cervix is distended by the adventitious formation of bands of fibrous tissue and the presence of numerous small cysts or ovula Nabothi. The first of these varieties is especially fungoid and soft to touch; the second, nodulated and of firm consistency. They often give to the cervix the shape of a club, or of the clapper of a bell (figs. 310 and 311).

Very different in appearance and structure is the hypertrophy of congenital and developmental origin, which appears at the time of normal uterine evolution, *i.e.*, puberty, and becomes more or less pronounced afterwards. Here it is not an alteration of texture due to inflammation which causes increase in volume. All the elements seem simultaneously to have undergone hyperplasia, and not to have deviated from the normal type, while the mucous coat is healthy. The cervix is greatly elongated, and conoid or cylindrical in shape, or the anterior lip may have

* Polaillon. Gigantic hypertrophy of the uterus (Union méd., Nov. 22, 1887, 3rd series, vol. 44, p. 745). The patient was aged 30; cause unknown; metritic symptoms. —Polaillon recommends ergotine injected into the uterine tissue, the continuous current, and, as a last resource, castration.

increased to a greater extent than the posterior.* It may fill the whole vagina and pass beyond the vulva, forming thus a prominence, which the woman takes for a prolapse of the womb. At the summit of the tumour is generally to be seen an extremely small orifice, through which a tiny drop of mucus makes its escape. Stenosis of the external os is a frequent corollary of this deformity, and the coincidence of these two conditions I have already mentioned.

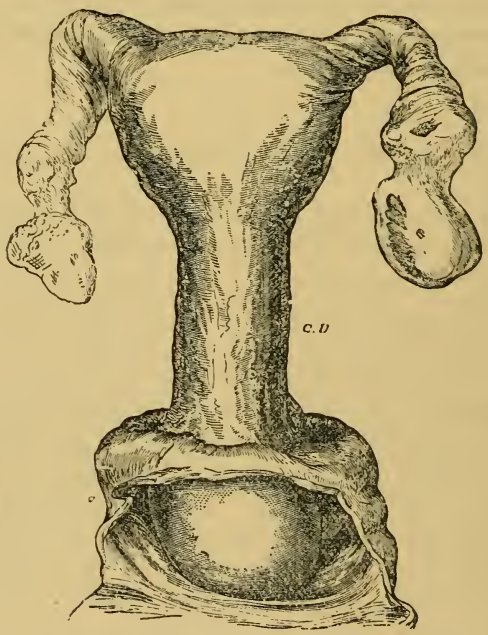

Fig. 309.—Hypertrophy of the infra-vaginal cervix.

Symptoms and diagnosis.—Signs of dysmenorrhœa often precede the appearance of the tumour at the vulva; it is this which arouses attention in young girls; to it, in married women, sharp pain during coitus (dyspareunia) is often added. If the hypertrophy of the cervix is not very great the penis pushes it forwards and makes for itself a kind of vaginal false passage, by depressing the posterior cul-de-sac, the depth of which is often considerably increased.

* Courty. Practical treatise on dis. of the uterus, 3rd ed., Paris, 1881, p. 991.—C. Ebermaier. Ueber Cervixhypertrophien des Uterus. Thesis, Würzburg, 1887

Pain, leucorrhœa, and metrorrhagia complete the symptoms. Examination by the finger and through the speculum easily allow of the recognition of the nature of the tumour ; persistence of the body of the uterus in its normal position will negative the idea of prolapse or inversion ; the continuity of the hypertrophied cervix and the body, combined with the presence of the external os at the summit, will put polypus out of the question. Careful bimanual examination and passage of the sound will show whether to this infra-vaginal condition there is added a greater or less degree of hypertrophy of the supra-vaginal cervix.

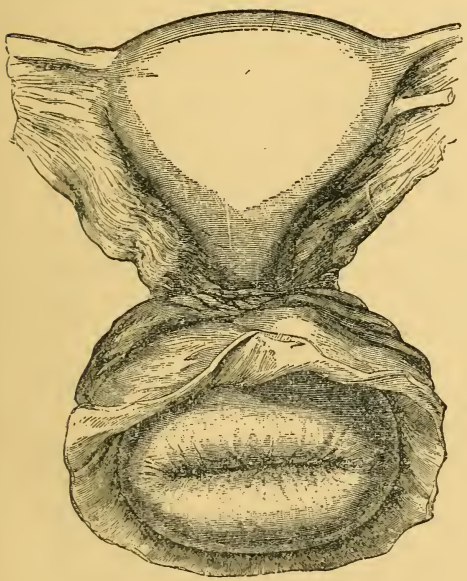

Fig. 310.—Hypertrophy of the infra-vaginal cervix with elongation of the supra-vaginal portion of the cervix.

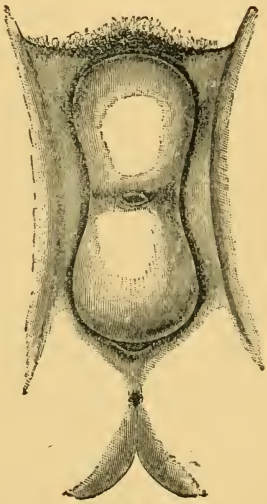

Fig. 311.—Hypertrophy of the infra-vaginal cervix with bilateral laceration.

Prognosis and treatment.—Once formed, the tumour has no tendency towards retrogression. An operation alone can cause the disappearance of this constant source of pains and accidents of the most varied kinds.

Bi-conical amputation of the cervix is the method of election. If hæmorrhage be feared, and if the surgeon be not sufficiently used to this kind of operation to complete it very rapidly, it will be advisable to provide for temporary arrest of hæmorrhage

by means of an elastic ligature, which should be prevented from slipping by means of a strong needle thrust through the cervix below the insertion of the vagina. My elastic "ligature" renders this manœuvre particularly easy.

After amputation of the infra-vaginal cervix, the supra-vaginal portion of it, if it were hypertrophied, might undergo complete retrogression.

BOOK VIII.

DISORDERS OF MENSTRUATION.

CHAPTER I.

PRECOCIOUS AND LATE MENSTRUATION.

In our temperate zones menstruation generally commences about the age of fifteen and ends about the age of forty-seven, thus giving to woman a generative life of about thirty-two years. Women who begin to menstruate early continue to do so to a little later than the ordinary age.*

Many examples are known of puberty being established in very young girls. The pubis becomes covered with hair, the external genitals and the breasts take on development very quickly, and then menstruation appears, to remain permanently or to disappear after a few years.†

In the body of a child aged four years who had menstruated regularly every three weeks since birth, Campbell‡ found an excessive development of the generative apparatus. Prochownick,§ who was able to perform an autopsy upon a little girl aged

* E. J. Tilt. The change of life in health and disease, 3rd ed., London, 1870.—Cohnstein. Ueber Menopause (Deut. Klin., 1873, No. 5, p. 45).

† Puech. The ovaries and their anomalies. Paris, 1873.—Cf. some interesting considerations on menstruation in various races and climates in a paper by James Stirton: On hæmorrhages from the unimpregnated uterus (Glasg. Med. Journ., July, 1887, vol. 2, p. 1 and foll.).—On the influence of constitution and the colour of the hair, cf. Sullies, Ueber die Zeit des Eintritts der Menstruation. Inaug. Dissert., Köngisberg, 1886. According to this writer tall blondes menstruate earliest.

‡ Campbell, cited by F. Müller, Die Krankheiten des weibl. Körpers, 1888, p. 226.

§ Prochownick. Fall von Menstruatio præcox mit Sectionsbericht (Arch. f. Gyn., 1881, vol. 17, p. 330).

three who had menstruated since she had been a year old, succeeded in demonstrating in the ovaries all the signs of remote and recent ovulation. Children have been seen to become pregnant under these conditions at the most improbable ages: seven and eight years,* ten years,† eleven years,‡ and twelve years§ of age.

These cases of precocious puberty in the female can be compared with analogous cases seen in the male;‖ I myself have seen such a case.

Late menstruation has to be received with much more caution.

* Lutaud. Precocious menstruation in a child aged seven years (Paris Obst. and Gyn. Soc., Dec. 11, 1890, in Répert. univ. d'obst. et de gyn., 1891, p. 302).—Kussmaul, Von dem Mangel der Verkümmerung und der Verdoppelung der Gebärmutter. Würzbourg, 1859, p. 42.

† Rowlet. Amer. Journ. of med. sciences, 1834, vol. 15, p. 266.—Cortis. Med. Times, April, 1863.—C. Macnamara. Lancet, Dec. 13, 1873, p. 852.

‡ Fox, cited by Harris, Amer. Journ. of Obst., 1870, vol. 3, p. 616.—Willard, ibid., p. 638.

§ M. Horwitz. St. Petersburg med. Zeit., 1867, vol. 13, p. 221.—In this paper will be found an analysis of most of the cases known at the time of its appearance: this history can be completed by reference to the work of Wallentin, cited below. The following are the most recently published cases on this subject:—

A. Van Derveer. Amer. Journ. of Obst., 1883, vol. 16, p. 1008. Child menstruating from the age of 4 months, periods every 28 days, and lasting four or five days. At the age of 2 years 7 months she had the appearance of a girl of 10 or 12 years; breasts and external genitals developed.—Cabadé. Gaz. méd. de Paris, Oct. 6, 1883, p. 474. Menstruation at 9 months. Rapid development of the external genitals.—Wallentin. Inaug. Dissert., Breslau, 1886. Menstruation from the age of 15 months. Development of the breasts and external genitals. The child was extraordinarily large for its age at 6½ years: height, 4 ft. 1 in.; weight, 63 lbs.; whereas the average figures (Gehrard) are for a child of 6 years 3 ft. 3 in., and 43 lbs. (In this work all the previously known cases are analysed.)—Casati. Il Raccogl., Oct. 13, 1886. Rickety child menstruating at 6 years 1 month. Development of breasts and external genitals. By rectal examination, pubescent uterus.—Loviot. Ann. de gyn., April, 1887, vol. 27, p. 293. Menstruation at 4 years (case shown at the Gyn. Soc. of Paris).—Bernard. Lyon méd., Aug. 14, 1887, vol. 55, p. 517. Menstruation from birth till 12 years of age without development of the genitals. Menstruation, which disappeared after a strong emotion, remained irregular. Married at 20, contracted syphilis from her husband, and died at 27 from cancer of the uterus. Bernard asked himself (without any plausible reason) whether the precocious menstruation had not predisposed her to cancer.—Diamant. Intern. klin. Rundschau, 1888, No. 40. Child of 6 years presenting a development of the genitals and breasts analogous to that of a girl at puberty. All teeth cut at the end of the first year. When not quite 2 years old menstruation began and lasted 4 days. At 6 years the flow ceased, and had not reappeared for 6 months previous to examination. During this time epileptiform fits occurred in place of the normal menstrual periods.—Kornfeld. Centr. f. Gyn., 1888, p. 395. Child of 3 years, daughter of an insane woman who incited her to masturbation. Menstruation appeared for 3 months; no further details; masturbation; normal mental condition.

‖ H. Beigel. Die Krankh. des weibl. Geschlechts, Erlangen, 1874, vol. 1, p. 325 (case of Flint South).

Every intermittent hæmorrhage, even if irregular, is easily regarded by a woman who is still about the age of the menopause, as persistence of menstruation, especially if there has been no interval of any length between these phenomena. It is then often a case of some as yet unrecognised uterine affection,* endometritis, mucous polypus, fibroid, and particularly cancer. Nevertheless, undoubted examples of very considerable persistence of menstruation reaching up to fifty-six and fifty-seven years have been reported. †

* F. Siredey. Art. Metrorrhagia, in the Dict. of pract. med. and surg., Paris, 1876, vol. 22, p. 430.

† E. Barić. Study of the Menopause. Thesis, Paris, 1877.—Kisch. Das Klimakterische Alter bei Frauen, p. 44.—Barker. Phil. med. Times, Dec. 12, 1874.—Knox. Menstruation in old age (Med. Record, 1888, vol. 33, p. 538).—A. Marx (Przeglad lekarski, 1889) has cited a case in which menstruation appeared at 48 years of age, and was regular for 4 years.

CHAPTER II.

Amenorrhœa.

Definition.—Pathogenesis. Ætiology. Amenorrhœa secondary to castration. Primary amenorrhœa. Secondary amenorrhœa. Influence of anæmia. Influence of the nervous system. Atrophy of the generative apparatus.—Symptoms. Cutaneous eruptions. Supplementary secretions. Vicarious menstruation.—Treatment.

By amenorrhœa is meant absence of menstruation and not absence of the regular flow through the generative tract. As a matter of fact, menstruation may be not absent but only latent, as in cases where the menses are retained owing to atresia, &c. These two orders of facts must be carefully distinguished. In the latter, the amenorrhœa, which might be called obstructive amenorrhœa,* is only a secondary symptom, and I refer the reader on this subject to the chapter on malformations of the generative organs.

Primary or permanent amenorrhœa, is that in which menstruation has never made an appearance: it has also been called emansio mensium.

Transitory, or better, secondary or accidental amenorrhœa, has also been called suppressio mensium.

Pathogenesis. Ætiology.—It may be said that in the female organism, during the period that extends from puberty to the climacteric, two existences are being carried on simultaneously: that of the individual and that of the species; that of all the organs in general and that of the generative apparatus in particular. This duality, of which the physiological and

* A striking example of the necessity of local examination in cases of amenorrhœa has been cited by Warnek. Moscow Obst. and Gyn. Soc. (Ann. de gyn., Jan., 1890, vol. 33, p. 43). The case was that of a multipara aged 53, in whom menstruation stopped abruptly. An abdominal tumour appeared and the patient succumbed to peritonitis in spite of an attempt made to evacuate by the vagina the menses retained in the uterus, the cervix of which was obliterated. This atresia, no doubt, followed upon an old-standing undiagnosed stenosis.

psychological consequences are so important, may be interrupted by the influence of disease, just as it ceases as the result of age. Amenorrhœa is neither more nor less than the absence or the suspension of the generative life produced either by some organic incompetency, or by some profound alteration of the general nutrition of the woman. This standpoint must be taken up to thoroughly understand the unexpected and extreme disorders sometimes occasioned by disturbance of this equilibrium. The generative apparatus is not, so to speak, a secondary wheel in the feminine machinery; it is, on the contrary, the main-spring of the whole mechanism; it is in view of the function which it fulfils that savings and compulsory reserve funds are incessantly being made, while the whole balance-sheet of nutrition, debtor and creditor, is drawn up with a view to the imminent conception to which woman ought, according to Nature's plan, always to find herself exposed. The Hindus, not without some show of reason, regard every menstruation that has not been preceded by coitus as infanticide, and consequently they marry their daughters immediately before puberty so as to save them from this involuntary crime. In the same way, with paradoxical conciseness it might be said that the normal state of woman is either pregnancy or suckling. During these periods menstruation ceases; it returns as soon as the excess of nutritive material cannot be usefully dispensed in either of these two ways. Menstruation therefore fills the office of a safety-valve; its absence is an index of a lowering in the intensity of nutrition, when it is not the normal result of a utilisation of its materials in view of the reproduction of the species.

Very few certain exceptions* are known to the general rule that menstruation is interrupted during the whole length of pregnancy; with regard to suckling, there are very many exceptions known, but as a rule the milk is more or less altered during the menstrual period.†

The necessary conditions for regular menstruation may be shortly stated thus:—

(*a*) Integrity of the generative apparatus;

* De Saint-Moulin (Brussels) in the Journ. d'accouch. de Liège, 1888, No. 18, p. 205, reports a case of persistence of menstruation during pregnancy, and a case of pregnancy in a woman, aged 24, who had never menstruated.

† L. Mayer. Berl. Beitr. zur Geb. u. Gyn., 1878, vol. 2, p. 124.—M. A. Raciborski. Treatise on Menstruation, Paris, 1868.

(*b*) Normal composition of the blood;

(*c*) Normal condition of the nervous system.

Any disturbing influence arising from one or other of the above conditions may either hinder the maturation of the ovum or oppose ovulation, or prevent, by an inhibitory action on the sympathetic and the vaso-motor nerves, that intense congestion which is the immediate cause of the menstrual flow.

Alterations of the two ovaries, cysts, sclerosis, peri-ovaritis, act directly upon the point of origin of the reflex, and if they are sufficiently advanced may abolish it altogether. But it is more common to see these alterations, not having destroyed the whole organ, play the opposite part of a stimulus, and produce metrorrhagia with dysmenorrhœa in place of amenorrhœa.

Does bilateral removal of the ovaries certainly lead to cessation of menstruation? This question, the answer to which long appeared quite simple, has quite recently been brought forward in surgery after a very large number of contradictory observations.

At the very outset, a distinction of the greatest importance must be made. The same value cannot be accorded to cases in which ovarian tumours, cystic or papillary, have been removed, and to cases in which castration has been performed for very slight alterations that had modified but little the volume and connections of the organ, as sclero-cystic degeneration, or to cases in which perfectly healthy ovaries have been removed (Battey's operation). The cases in the first category should be rejected, for it is impossible with large tumours to be absolutely certain that a fragment of ovarian tissue has not been left in the pedicle, and that alone is sufficient for the continuance of the monthly flow.

There remains, however, a large number of undeniable facts, belonging to the two latter categories, in which, in spite of double castration, menstruation has continued more or less regularly.*

* Storer. Amer. Journ. of med. sci., Jan., 1866, vol. 51, p. 119.—Voss (Sweden). Centr. f. d. med., Wissensch., Nov. 27, 1869, p. 837.—Goodmann. Richmond and Louisville med. Journ., 1875, and Ann. de gyn., 1876, vol. 6, p. 231.—Terrier. Gaz. hebd., Dec. 27, 1878, p. 831.—Malins, B. M. J., 1880, vol. 1, p. 772.—Ormières. On menstruation after ovariotomy and hysterectomy. Thesis, Paris, 1880 (Ormières has collected 45 cases).—Campbell. Amer. Soc. of gyn. of Philadelphia, Sept., 1883 (Centr. f. Gyn., 1884, p. 348).—Hennig. Ueber menstruation nach doppelter Oophorotomie (Leipzig obst. Soc., Nov., 1887, in Centr. f. Gyn., 1888, p. 360). He relates two cases of his own and one of C. Braun's of Vienna.—Tuttle. Regular menstruation after Tait's opera-

But it must be noted that whenever the patients have been watched for a sufficiently long time, these prolonged, and if one may so speak, posthumous, menstruations ceased at the end of some months. It is therefore unnecessary here to invoke, as has been done for the necessities of the case, the possible existence of a supplementary ovary; it is quite sufficient to recall the well-known law of the persistence of organic habits. It is quite well understood that the nervous system of the vegetative life, exactly like that of the life of relation, may reproduce, so to speak, automatically, and under the influence of a former stimulus, acts like that of the congestion of the generative apparatus. It is just like that of motion continued as the result of acquired velocity, which nevertheless, in the absence of a fresh application of force, slackens down and finally comes to rest.

There is one circumstance, moreover, which may favour the temporary prolongation of the menstrual nixus, and it is the presence of changes in the uterine mucous membrane or parenchyma, which are invariably found in cases of fibroids for which castration has been performed, and very frequently in cases of obstinate oophoro-salpingitis, for which the appendages are removed. And therefore in all these cases I hold that the major operation should be terminated by a complementary curettage.*

Czempin † also attributes a certain importance to passive

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tion (Amer. Journ. of obstet., 1888, vol. 21, p. 612). L. Tait. Menstruation and the ovaries (Lancet, 1888, vol. 2, pp. 1044 and 1204).—Bantock (Brit. Gyn. Journ., Feb., 1889), relates several cases in which menstruation persisted long after complete removal of the two ovaries.—Macario, Quénu, Terrillon. Bull. et Mém. Soc. de chir., 1889, p. 31.—R. Pichevin. The abuse of castration in women. Thesis, Paris, 1889.—Glaevecke (Arch. f. Gyn., 1889, vol. 35, part 1, p. 1) has come to the conclusion that menstruation ceases completely in 88 per cent of cases immediately, or a short time after castration. In 12 per cent. there is a slight and irregular discharge. In half the cases the nixus persists; in about the same number the women become fat.

* Sänger (Leipzig Obst. Soc. in Centr. f. Gyn., 1888, p. 361), out of 49 cases of castration only twice saw persistence of the monthly flow; in one case after castration performed for retroflexion complicated by endometritis, periodic menorrhagia having continued, the surgeon did not hesitate to re-open the belly to make certain of the condition of the pedicles; he found no trace of appendages. The hæmorrhages disappeared after curettage, showing well the part taken in their production by the concomitant endometritis. In a second case castration was performed for multiple myomata. The catamenia persisted, slightly diminished, for a year; Sänger attributes them to the endometritis.

† A. Czempin. Zeitschr. f. Geb. u. Gyn., 1886, vol. 13, part 2, p. 339.

congestion, due to compression of veins by the cicatricial tissue which results from the operation.

Amenorrhœa secondary to castration generally coincides with certain physical changes: increase of fatness, atrophy of the breasts, and sometimes with marked change of temper, which becomes more placid.*

Removal of the Fallopian tubes alone does not seem to influence menstruation if the ovaries are healthy,† which entirely overthrows Lawson Tait's view upon the preponderating influence of these organs upon the function.

Primary amenorrhœa may also be due to bad nutrition or defective hygiene, which has brought about a retardation in the general development of the organism; intellectual over-pressure and the absence of exercise in some schools and convents have succeeded in producing amenorrhœa in addition to chlorosis. It is intelligible that young girls with hereditary strumous antecedents, being particularly weakly, are especially predisposed thereto. Inversely, change of *régime*, a nitrogenous and abundant diet suddenly substituted for an exclusively vegetable diet, lack of exercise in the open air, in the case of young country girls who come to live in towns, by producing a sudden plethora, very often lead to a retardation in the appearance of menstruation. Secondary amenorrhœa may be caused by impoverishment of the blood and a condition of profound debility in the course of a chronic, or as the result of an acute illness. Anæmia, chlorosis, Bright's disease, diabetes,‡ alcoholism,§ the morphia-habit,‖ cancerous or malarial cachexia, pulmonary tuberculosis, convalescence from the acute fevers, act in this way. Acute or chronic surgical diseases may, in the same way, bring amenorrhœa in their train. These facts, which have recently

* Glaevecke. Körperliche und geistige Veränderungen im weiblichen Körper, nach künstlichem Verluste der Ovarien, &c. (Arch. f. Gyn., 1889, vol. 35, part 1, p. 1).

† J. L. Championnière (Répert. univ. d'obst. et de gyn., 1888, p. 220) relates a case in which menstruation remained regular after double salpingotomy, without interference with the ovaries, which were healthy.

‡ Cohn. Zur Kasuistik der Amenorrhöe bei Diabetes mellitus und insipidus (Zeitschr. f. Geb. und Gyn., 1887, vol. 14, part 1).—Lecorché. Diabetes mellitus in women, Paris, 1886, p. 171.

§ C. H. Carter. Amenorrhœa associated with alcoholism (B. M. J., 1888, vol. 1, p. 1383).

‖ Roller. Ueber das Verhalten der Menstruatio bei Anwendung von Morphium und Opium (Berl. klin. Woch., 1888, No. 48, p. 966).

been again studied, were long ago fully observed by Dupuytren.*

It is again to the profound anæmia which accompanies invasion of the system that the amenorrhœa of syphilitic subjects, upon which Fournier † has laid stress, must be attributed, as well as that which occurs in young women when they become extremely fat,‡ obesity being a defect in nutrition that is often very debilitating.

The influence of the nervous system has a great deal to do with the production of amenorrhœa. Fright often produces a temporary cessation of menstruation.§

The moral depression of prisoners and of insane persons shut up in asylums has as much to do with the production of their amenorrhœa as anæmia. Chlorosis, which leads to anæmia, seems very distinctly to be a disease of the nervous system. Absence of menstruation is very common amongst hysterical patients.

Sudden chill, which is often noted as an occasional cause of amenorrhœa, probably acts through the vaso-motor nerves.

It is to the inhibitory power of the nervous system that the emotional amenorrhœa of the newly-married, or of women who ardently desire children, must be referred; its coincidence with a certain amount of tympanites has often led to illusions which have been brusquely dispelled. There is a variety which might be called the amenorrhœa of fear,‖ occurring in women who, by reason of illicit intercourse, or for any other reason, fear pregnancy (Raciborski). I have seen several examples of these various forms. The two last have some analogy with auto-suggestion.

* Dupuytren (Clinical lectures, vol. 2, p. 305) cites a work by Brierre de Boismont which the Academy deemed worthy of recompense, in which he showed the influence of disease upon menstruation. "Several times," Dupuytren adds, "we have seen menstruation become disordered or suppressed in the course of a chronic or acute surgical affection or after a major operation." (Then there follows a detailed notice of the effect of wounds in causing menstruation to postpone or anticipate or become in other ways deranged.) This subject has again been taken up by Terrillon (Progrès méd., 1874, p. 737).

† A. Fournier. Lectures on syphilis in the female, Paris, 1873.

‡ C. A. Currier. The influence of obesity in young women upon the menstrual and reproductive functions (Med. Record, 1888, vol. 33, No. 6, p. 162).

§ Inversely cases have been related of amenorrhœa cured by powerful emotions. R. J. Roberts (B. M. J., Nov. 16, 1889, p. 1093) reports a case of a young woman in whom the flow, which had been suspended for nine months, was brought back by a fright.

‖ Raciborski (*loc. cit.*) has very clearly pointed out the amenorrhœa of psychical origin.

Suggestion has an undoubted influence upon a certain class of subjects.*

Atrophy of the uterus from exaggerated involution, secondary to repeated pregnancies, prolonged lactation, the morphia-habit, † &c., causes amenorrhœa.

Symptoms.—Absence of sanguineous discharge from the generative tract at its regular periods constitutes the chief sign. But the concomitant nervous symptoms must not be forgotten, as they may sometimes be very serious, presenting under the form of chlorosis or anæmia. Certain sensorial disorders, weakness of sight, ‡ of hearing, paraplegia, § seem to be as much dependent upon the amenorrhœa as upon the hysteria alone.

Amenorrhœa coincides in certain cases with periodic cutaneous eruptions, which in other women occur at the menstrual periods. *e.g.*, acne, eczema, herpes, urticaria, pemphigus, erysipelas. ‖ Profuse sweating and swelling of the face and feet, doubtless owing to some vaso-motor neurosis, ¶ excessive development of hair have also been reported.

* The power of suggestion (hypnotic) upon the menstrual function is put beyond doubt by numerous cases. I have seen a hysterical patient who was an in-patient at the Villejuif Asylum, under the care of Marcel Briand, in whom the appearance of menstruation could thus be postponed or made to anticipate, several days.—Cf. on this subject: Bernheim. On a case in which menstruation was regulated by suggestion (Arch. de tocol., 1887, p. 891).—Kobylinski. Dysmenorrhœa cured by suggestion (Vratch, 1887, No. 45).—Hugenschmidt. Treatment of dysmenorrhœa by mental suggestion or hypnotism (Med. and Surg. Reports, Philad., 1888, vol. 9, p. 453).

† W. Levinstein. Frühzeitige Atrophie des gesamm. Genitalapp. in einem Fall von Morphiummissgebrauch (Centr. f. Gyn., 1887, No. 40, p. 633).

‡ Abadie. Treatise upon dis. of the eye, 1884, vol. 2, p. 260.—Dehenne. Pathological relations of the eye and the uterus (Ann. de gyn., 1879, vol. 12, p. 174).—Mooren. Gesichtsstörungen und Uterinleiden (Arch f. Augenheilk., 1881, vol. 10).—Karafiath. Erblindung mit akuter Papillo-retinitis bedingt durch Ausbleiben der Menstruation (Centr. f. Gyn., 1884, No. 17, p. 270).—Clifton S. Morse. New York Med. Journ., Jan. 22, 1887, p. 95.—Cohn. Uterus und Auge, &c., Wiesbaden, 1890.

§ J. W. Bowee. Suppressio mensium and paralysis of lower extremities resulting from nostalgia; local and general faradisation; cure. (Obst. Gaz. Cincinnati, 1888, vol. 11, p. 285).

‖ Danlos. Cutaneous eruptions at the menstrual periods. Thesis, Paris, 1874.—G. H. Rose. Amer. Assoc. of obst. and gyn., Sept., 1888 (analysed in Ann. de gyn., Jan., 1889, p. 66).—Stiller. Berl. klin. Woch., 1877, No. 50, p. 731.—Wilhelm. Ibid., 1878, No. 4, p. 50.—Schramm. Ibid., No. 42, p. 626.—Wagner. Allg. med. Centralzeit., 1878, No. 94, p. 1173.—Rouvier. Phenomena supplementary to menstruation (Ann. de gyn., 1879, vol. 12, p. 10).—L. Joseph. Ueber die Beziehungen von Dermatosen in Genitalerkrankungen des Weibes (Berl. klin. Woch., 1879, No. 37, p. 554 and foll).—J. Heitzmann. Vicärurende Menstruation und Menstrual-Exanthem (Wien. med. Jahrb., 1884, part 1, p. 9).

¶ Borner. Ueber nervöse Hautschwellung als Begleiterscheinung der Menstruation und Climax (Samml. klin. Vortr., 1888, No. 90, p. 312).

These facts serve, so to speak, as a transition to the most remarkable consideration of vicarious menstruation. They well show the inter-dependence of the whole organism and the possible reciprocity that may exist between the external skin and the uterine mucous membrane.*

There are known some curious cases of what might be called vicarious secretions. Jones † has reported the case of a young woman who, after suppression of menstruation, probably due to a severe chill, was affected with amenorrhœa, and for five years instead of the menstrual flow presented an abundant discharge of milk from the breasts, lasting for 36 hours. Another woman who had had several children used to be attacked during the first three days of the catamenial period by an abundant diarrhœa with a leucorrhœic discharge that ended with the appearance of a little blood. He cites also a case of periodic leucorrhœa taking the place of menstruation.

Variations in menstruation, supplementary menstruation, ‡ vicarious or ectopic menstruation, offer some of the most curious and unexpected examples. § One of the most frequent places whence discharge of blood occurs is the bronchial or pulmonary mucous membrane, ‖ the patient having hæmoptysis at regular intervals that may give rise to a suspicion of pulmonary tuberculosis. Hæmatemesis has been observed as well as epistaxis, hæmorrhage from the rectum, ¶ particularly in the case of those women who are plethoric and suffer from piles, discharge of blood from the ear** if there has previously existed a purulent

* Teplischin. Med. Rundschau, 1888, No. 1.

† G. E. Jones. Trans. obst. Soc., Cincinnati (Amer. Journ. of Obst., 1887, vol. 20, p. 92).

‡ This curious phenomena has long been recogni-ed. G. E. Stahl. De mensium insolitis viis, Halle, 1702.—A. de Haller (Elementa physiologiæ, Berne, 1765, vol. 7, 2nd part, p. 157) describes very exactly "Quæ mensium locum tenent."—Cf. Scanzoni, *loc. cit.*, p. 277.—Courty, *loc. cit.*, p. 473.—Puech. Comptes rendus Acad. des Sciences, Dec. 9, 1861, vol. 53, p. 1066. G. Lorey. Vomiting of blood in the place of menstruation, Thesis, Paris, 1875.—L. Torthe. A rare form of vicarious menstruation. Thesis, Paris, 1877.

§ J. H. Camiade. Vicarious menstruation. Thesis, Paris, 1872.

‖ R. Thomas. Amer. Journ. of Obst., 1886, vol. 19, p. 141.—C. O. Wright (ibid., 1887, vol. 20, p. 88) reports three cases of this kind.

¶ E. C. Barrett. Vicarious menstruation per rectum (Virginia Med. Monthly, Richmond, 1875, p. 671).

** Gilles de la Tourette (Prog. méd., 1882, No. 35, p. 668), has published the case of a young girl, aged 18, who had had for 6 years a purulent discharge from the ear. When 14 years of age, she woke up one night bathed in blood which had flowed from

otorrhœa which has made the ear a *locus minoris resistentiæ*, or even if the tympanic membrane was healthy. More rare are cutaneous hæmorrhages, either as ecchymoses and petechiæ, discharge of blood from some definite spot where the skin is intact* or from the surface of an ulcer. I have seen at the St. Louis Hospital a nurse afflicted with lupus of the face who had at each period a free oozing of blood from this region.

Treatment.—It is a mistake to think that amenorrhœa calls for special remedies having a specific action upon the uterine mucous membrane. The emmenogogues, rue, savin, saffron,† apiol,‡ may all be used in special cases, however, when some very distinct occasional cause, such as a chill or some violent mental perturbation, has caused cessation of the catamenia. They must be prescribed with moderation during the particular time when the function is absent. The same may be said of hot baths (40°—45° C.) Drastic and saline§ purgatives may also be administered to bring about a certain amount of pelvic conges-

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the ear; this re-occurred afterwards every three weeks regularly, and only once did menstruation return normally.—Stepanow (Med. Randschau, 1885, No. 19) relates the case of a young hysterical patient, aged 17, in whom the tympanic membrane was not perforated, and the ear seemed healthy. Menstruation occurred therefrom and lasted two days. The writer mentions three similar cases by Ménière, but in them the ear was diseased, and cases by Jacobi, Benni, Henzinger, Huss, and Lang.

* Stear (Lancet, May 13, 1882, p. 786) reports a case of supplementary menstruation from the breasts; the woman was 50 years of age, and the hæmorrhage was of 12 months' standing.—Gordon (Amer. Journ. of Obst., April, 1882, p. 343) has published the following case; the patient, æt. 41, was strongly built. For seven years the courses had disappeared, and a discharge of blood which lasted 3 to 5 days occurred regularly from bluish spots which existed at the level of the phalangeal joints of the thumbs on the palmar aspect. This discharge was interrupted by a pregnancy.

† The following is a prescription given by de Sinéty:

℞. Aloes, Rue, Savin, Saffron } āā gr. ¾ to be taken once or twice a day.

‡ Apiol, the active principle of apium petroselinum, has been especially recommended by Joret (Bull. gén. de ther., Feb., 1860, vol. 59, p. 97) and by Marotte (ibid., Oct., 1863, vol. 65, pp. 295 and 341). It is given in capsules, each containing 4 grains, night and morning at the monthly periods in dysmenorrhœa, or at their supposed date in amenorrhœa.

§ The usual drastic purgatives are the following: aloes, scammony, jalap, podophyllin, cascara, &c. I prefer to order 10 grammes of compound tincture of jalap (eau-de-vie allemande) in a cupful of weak coffee.—The best saline purgative is citrate of magnesia (45 grammes) or the various natural mineral waters, Hunyadi-Janos, Pullna, Birmenstorff, &c.

tion. Recently permanganate of potash has been recommended as a sovereign remedy.*

As a rule it is the causal indication that must be followed, and since amenorrhœa depends upon either impoverishment of the blood or some nervous trouble, hæmatinics, tonics, and general improvers of nutrition must be resorted to, and of these particularly iron, manganese, † and hydrotherapeutic treatment. I attach far greater importance to this general "building up" treatment than to scarification of the cervix, the use of a galvanic pessary, &c. Electricity (faradaic or continuous current) may give some good results, and ought not to be neglected. Bigelow, ‡ in the amenorrhœa of young chlorotic girls, recommends static electricity as a general tonic. In the intermittent variety of amenorrhœa amongst plethoric subjects advantage is to be obtained from the use of the continuous current, the positive electrode being placed in the uterine cavity. With virgins one pole is placed over the lumbar region and the other over the uterus externally; with anæmic women who are not virgins one pole would be placed by preference in the uterus and the other at the hypogastrium. Bigelow ‡ is also a strong supporter of general electrical treatment in amenorrhœa, one pole being placed at the nape of the neck and the other in a salt-water foot-bath; he particularly recommends this method for use with irritable, nervous, and chlorotic young girls. The treatment should be commenced some days before the assumed date for the onset of menstruation and continued daily until it makes its appearance. In addition physical exercise should be prescribed, open air walking, gymnastic exercises, a stay at the sea-side or at some elevated spot, and finally distraction and absence of all moral pre-occupation.

In amenorrhœa of young women threatened with or affected with obesity I have several times brought back menstruation by

* Boldt (New York). Therap. Gaz., Jan. 15, 1887, p. 625.—P. W. Macdonald. Permanganate of potassium in the treatment of amenorrhœa associated with mental disease. (Practitioner, 1888, vol. 11, p. 248).—Hart and Barbour give this formula:

℞. Potassii permanganatis, Kaolin āā gr. iiss.
Vaseline q. s.
ft. pil. ter in die sumend.

† Watkins. Arch. de tocol., 1887, p. 614.

‡ H. Bigelow. Gynæcol. Electrotherapeutics, London, 1889, p. 159.

attacking the obesity on the dry diet principle, forbidding carbo-hydrate diet, ordering exercise and thermal baths (Brides, Salies de Béarn), and finally exciting the mucous membrane of the uterus by means of curettage followed by iodine injections at the assumed monthly periods.

In women on whom castration has been performed and who have remained amenorrhœic it is not uncommon to observe in the early months after cessation of menstruation the appearance of certain periodic troubles, consisting of lumbar pains, flushes of heat, vertigo, and a particular irritability of character, in a word a real nixus, which is the more painful in that it only passes off slowly, the natural crisis being absent. In such cases I have often seen beneficial results from scarifying the cervix at the regular periods and producing a slight local bleeding. To this I add the exhibition of saline purgatives. One of the patients upon whom I had operated came back regularly to me for more than a year to undergo this trivial operation, which procured her immediate relief. In time these symptoms end by disappearing spontaneously.

CHAPTER III.

Menorrhagia.

Definition.—Symptoms.—Ætiology.—Pathogenesis.—Treatment.

Exaggeration of the menstrual discharge constitutes menorrhagia: metrorrhagia is distinguished by appearance of blood at other than the menstrual periods.

Symptoms.—The symptoms of menorrhagia are abundance and long duration of the flow, the production of clots, and general weakness. These phenomena do not constitute a single disease, but are the symptoms of several diseases.

Ætiology.—Two classes of causes may produce menorrhagia:

1. *General causes acting by alteration of the blood.*—Of this kind are all such diseases as hæmophilia, purpura, scurvy, acute yellow atrophy, phosphorus poisoning, Bright's disease, obesity, and all the cachexiæ. In these amenorrhœa is sometimes seen to alternate with menorrhagia. Finally, true "uterine epistaxis" (Gubler) occasionally ushers in certain fevers.

2. *Local causes*, which are:—

A. Reflex excitation starting from the generative organs (and particularly the appendages) independently of all appreciable lesion and by simple nervous disorder, as at puberty, on marriage, at the menopause. In this class must also be included menorrhagia induced by lactation,* caused doubtless by some reflex excitation starting from the breast.

B. Almost all the diseases of the uterus and appendages: metritis, fibroids, cancer, ovarian tumours† (especially those

* Lande. On a form of metrorrhagia produced by suckling (Bordeaux med. Journ., 1878-9, p. 369).

† S. Gottschalk, pupil of Landau (Arch. f. Gyn., 1888, vol. 32, part 2, p. 234) has recently described a curious change in the ovary which gave rise to profuse hæmorrhages; it was a true cavernous metamorphosis. The uterus and ovaries were removed per vaginam.

which are close to the uterus, *e.g.*, intra-ligamentous cysts), diseases of the tubes. I here confine myself to making an enumeration, for I have only to give a sketch and not to fill in all the details, which will be better found under the description of each particular affection.

This symptom ought only to be treated separately when it is sufficiently important to cause anxiety. At the same time an attempt must always be made to attack it at its source. I here simply mention the empirical hæmostatic means that are at the practitioner's disposal. The first, local in action, are in particular prolonged irrigation with very hot water (45°—50° C.) and plugging of the vagina. Emmet was the first to resort to temporary suture of the cervix, a procedure that may be adopted when all others have failed.* Martin sometimes ligatures *en masse* the lower branches of the uterine artery through the vaginal culs-de-sac. I have seen this operation successful in his hands.

In the second place, general methods should be adopted, such as the recumbent position, with slight elevation of the pelvis, opium in the form of injections containing laudanum, ergot of rye, by the mouth and by hypodermic injection.† Gallard strongly recommends the infusion of digitalis‡ as a calmative of the hæmorrhage by lowering the arterial tension.

In the last place, if the menorrhagia become threatening, would one be justified, even in the absence of an exact diagnosis, in undertaking a radical operation? In such cases vaginal hysterectomy has seemed legitimate even for hæmorrhagic endometritis when it had resisted all other treatment. Other surgeons have then performed castration, which is a less serious operation, and, under the circumstances, quite as effective.§ Olshausen relates the case of a woman, aged thirty-nine, who was afflicted with no other recognisable disease

* Koteliansky (Presse méd. belge, 1889, p. 380) has related a case of this kind which was successfully operated upon by Onoutrieff.

† Seven and a half grains of ergot of rye freshly powdered taken every three hours. Yvon's ergotine may be administered beneath the skin twice or thrice in the 24 hours, the dose being half a Pravaz syringeful; but the use of ergot in full doses cannot long be continued without risk.

‡ Ten cgr. of digitalis leaves infused in a litre of water and taken in the 24 hours.

§ Hofmeier, cited by Olshausen. Die Krankh. der Ovarien, 1886, p. 449.—O. Terrillon. Soc. obst. et gyn. (Répert. univ. d'obst. et de gyn., 1888, p. 194 and foll.)—J. Lucas-Championnière, ibid., p. 210.

save incontrollable menorrhagia; for this he performed castration with the most satisfactory results. Nevertheless these exceptions must not be converted into a definite line of treatment, and Walton* has, very justly, opposed the excessive tendency that certain surgeons have to interference in this direction.

* Walton. Drainage of the uterine cavity. Ghent, 1888.

CHAPTER IV.

Dysmenorrhœa and Nervous Disorders of Menstrual Origin.

Definition.—Division. Ovarian Dysmenorrhœa. Uterine Dysmenorrhœa.—Symptoms and diagnosis. Prolapse of the ovary. Nervous disorders.—Treatment. Castration (Battey's operation). Uterine castration. Method of performing ovarian castration. Abdominal incision. Vaginal incision.

At the menstrual periods women find themselves generally, to use the common term, "unwell," that is to say, they feel general malaise, some vague pains in the lumbar region, and a peculiar irritability of temper. But these phenomena are ordinarily of slight account. If menstruation is very painful, and is accomplished with difficulty, it constitutes dysmenorrhœa.

Divisions of the subject have been multiplied. There have been admitted: 1. A neuralgic or sympathetic dysmenorrhœa; 2. A congestive or inflammatory; 3. A mechanical or obstructive; 4. A membranous; and 5. An ovarian dysmenorrhœa. But it can be greatly simplified by considering the pain under two conditions, viz., whether it occurs during the ovario-tubal stage (maturation of the follicle, ovulation) or during the uterine stage (expulsion of the menstrual blood).

Dysmenorrhœa of ovarian origin.—This may result from irregular development of the generative organs, according as the uterus and ovaries have remained in the pubescent stage, or as the ovaries have arrived at the adult condition, the uterine development having lagged behind. There is then an inevitable irregularity in the menstrual process, on account of either the difficulty of ovulation, or of the disproportion between the intensity of the congestive phenomena on the side of the ovary during ovulation, and the doubtful state of the concomitant congestion on the side of the uterus; this leads to an abnormal exaggeration of the ovarian erethism and the pain of dysmenorrhœa.

Diseases of the appendages are also another very common cause. I am not speaking only of acute inflammation or of profound change, such as salpingitis, hydro-, hæmato-, and pyo-salpinx, but also of the results, often but limited in extent, of old lesions, adhesions, false membranes compressing the surface of the appendages or dragging them into an abnormal position, which lead to fibroid changes in the ovaries and obliteration of the Fallopian tubes; these are very frequent, and often undiagnosed causes of intense pain at the menstrual periods. Tubo-ovarian varicocele (Richet), that is to say, varicose dilatation of the pampiniform plexus and the veins of the broad ligament, seems also to be to some degree responsible. It is often accompanied, as I have myself seen, by chronic ovaritis and atrophy of the ovary, just in the same way as atrophy of the testicle supervenes upon varicocele in the male.*

Dysmenorrhœa of uterine origin.—The principal factor in this class is a mechanical obstacle to the escape of the blood; in this way act stenosis of the os, with or without hypertrophy, misplacements of the uterus, and particularly flexions, metritis (swelling of the diseased mucous membrane and accompanying salpingitis), various tumours, fibroids, mucous polypi, malignant growths. Along with acute metritis I described that special form which is accompanied by exfoliation of the whole mucous membrane, and which constitutes the disease artificially created by some writers under the name of membranous dysmenorrhœa.

I do not think that there is any necessity to distinguish a gouty or a rheumatic dysmenorrhœa; all we can say is that subjects of the arthritic diatheses are particularly liable to various neuralgic complaints.

Symptoms and diagnosis.—The pain of dysmenorrhœa has somewhat different characters according to its point of origin. At the commencement of menstruation ovarian pain predominates; when it is in full swing, uterine pain becomes more accentuated.

The so-called inter-menstrual dysmenorrhœa ("Mittelschmerz" of German writers) is only called dysmenorrhœa by a misapplication of the term. The name has been given to attacks of pain in the ovarian region, supervening in the inter-menstrual

* P. Petit. Lesions of the ovary in pelvic varicocele (Nouv. Arch. d'obst. et de Gyn., 1891, p. 488).

periods, and hypothetically attributed to ovulation.* They are but symptoms of inflammation in the uterus or the appendages.

I have previously† described the characters of the pain of dysmenorrhœa, and I shall not return to them at any length.

Customarily the pain appears at the same time as the discharge, and is especially severe during the first two days of menstruation. Sometimes even, when there is no mechanical obstacle or narrowing of the cervical canal, the blood only comes drop by drop, like the urine when there is strangury; from this characteristic Ætius gave to the condition the name of "stillicidium uteri." The appearance of small clots indicates that the blood stagnates in the uterine cavity, and their expulsion coincides with increase of the pain, which may be so intense as to lead to hysterical attacks, or even to syncope.

The menstrual period may become extremely painful, after having long been a period of relief to the patient; this is especially to be observed in cases of salpingitis that are passing from an acute to a chronic condition.

The object of diagnosis is first of all to distinguish true dysmenorrhœa from some forms of lumbo-abdominal neuralgia which, undergoing exacerbation at the menstrual periods, may simulate it; the search for other neuralgiæ and for tender spots will facilitate this task. Then for the recognition of the ovarian or the uterine origin of the pain, a careful local examination will be necessary. The phenomena observed before the periods will render much assistance.

The study of these various questions has been gone into when dealing with each of the diseases I have enumerated.

I must draw particular notice to the dysmenorrhœa, and the serious reflex phenomena that may be induced by prolapse of the ovary; digital examination then permits of the recognition, in Douglas' pouch, of a tumour whose peculiar sickening tenderness is characteristic. Two accompanying symptoms are pain during defæcation and during coitus.‡

Battey, and following him many gynæcologists, particularly

* W. Priestley. Cases of intermenstrual or intermediate dysmenorrhœa (B. M. J., Oct. 19, 1871).—H. Fasbender. Ueber den sogenannten Mittelschmerz. (Zeitschr. f. Geb. u. Frauenkr., 1875, vol. 1, p. 125).—Sorel. Hypogastric pain or intermenstrual dysmenorrhœa (Arch. de tocol., March, 1887, p. 269).

† Cf. chapters on Metritis, and Stenosis of the cervix.

‡ Paul Vallin. Situation and prolapse of the ovaries. Thesis, Paris, 1887, No. 266.

in America, have attached very great importance to the co-existence with menstrual disorders, amenorrhœa and dysmenorrhœa, of serious nervous disorders, such as hysteria, epilepsy, and mania; and thus have arisen the words oophoralgia, oophorepilepsy, oophoro-mania. There is no doubt that a certain proportion of these patients are the subjects of a pathological reflex starting from ill-developed or altered ovaries. But the difficulty of a precise diagnosis is extreme, and the surgeon ought to exercise very great caution, and this is not always the case on the other side of the Atlantic. Side by side with a small number of very clear cases in which the influence of the menstrual period is evidently preponderant, and in which the congested ovary seems, for example, to be the starting-point of the aura in epilepsy, there is a very large number in which the menstrual disorders may have simply coincided, and the coincidence in no way forces upon one a sense of their causal influence.

As palliative treatment for the pain may be used bromide of potassium, chloral,* ammoniated tincture of valerian, assafœtida,† musk, tincture of Indian hemp, belladonna, and hyoscyamus.‡ Antipyrin§ in hypodermic injection is a valuable resource; in the most intense attacks inhalation of ether might reasonably be prescribed. Oxalate of cerium‖ has been recommended. Wylie¶ highly praises electricity; he places the positive pole in the interior of the cervix. Injections containing laudanum or valerian sometimes give relief when other remedies have failed.

The general treatment should be that suitable for the anæmia or the neurotic condition of the patient.

There are no general indications for the curative treatment.

* Dubois. Chloral and bromide of potassium in dysmenorrhœa (Gaz. hebd. des sc. méd. de Bordeaux, June 5, 1888).

† A. Courty (Practical treatise on diseases of the uterus, 3rd ed., Paris, 1881, p. 492) recommends 10 cgr. of assafœtida in pill every hour, or 25—30 drops of the following antispasmodic mixture: sulphuric ether, tincture of valerian, tincture of castoreum, laudanum, of each 5 grammes.

‡ Shaw. The value of belladonna and hyoscyamus in dysmenorrhœa (Lancet, 1888, vol. 2, p. 570).

§ Dellenbauch. Med. Record, May 21, 1887, vol. 31, p. 578.—Windelschmidt. Allg. med. Centralzeit., Berl., 1888, p. 1029.

‖ M. L. Chambers. Oxalate of cerium in dysmenorrhœa (Med. Rec., New York, 1888, vol. 2, p. 12).

¶ Wylie. The American system of gynæcology, vol. 5.

It varies essentially with the cause of the dysmenorrhœa. If it resides clearly in the uterus or appendages the initial lesion must be attacked. In cases where this lesion is doubtful, or where the disease is dependent upon functional troubles of an ill-defined origin, treatment presents great difficulties. As a matter of fact, one may often hope to see the condition disappear almost spontaneously with an increase in years, marriage, and impregnation in the large number of cases in which it is due to delay in the full development of the internal generative organs with or without stenosis of the os. There are, however, cases in which there is no parallel at all between the functions of the ovary and those of the uterus. There are others in which these functions are definitely disordered by acquired lesions (adhesions, misplacements), which permanently prevent the ovary from properly carrying out its function. The periodic pain may become unbearable and undermine the health. Furthermore, it has been thought that some frequently serious disorders, such as epilepsy and mania, are of reflex origin and immediately dependent upon the dysmenorrhœa. It is in these cases that extirpation of healthy ovaries has been performed with the object of putting an end to the pain by abolishing the function which called it forth.

This special indication for oophorectomy, castration, or normal ovariotomy (a term which signifies that the ovary is of its normal size), was first put forward by Battey* in America, and later by Hegar† in Germany, and Lawson Tait‡ in England. According to Battey,§ by whose name the operation goes, the surgeon, before resolving in such a case upon castration, ought to ask himself the following questions: 1. Is the case serious? 2. Is it curable by any other medical or surgical procedure? 3. Is it

* R. Battey. Normal ovariotomy (Atlanta med. and surg. Journ., Sept., 1872 and 1873). His first operation was on August 17, 1872.

† A. Hegar. Die castration der Frauen (Volkmann's klin. Vortr., Leipzig, 1878, No. 42). His first operation was on July 27, 1872, and was consequently prior to Battey's by nearly a month. But Hegar's patient died of peritonitis, and he did not repeat the operation till Aug. 2, 1876, long after Battey had vulgarised the operation which bears his name.

‡ Lawson Tait. B. M. J., May 31, 1879.—Dis. of the ovaries, 1883, p. 327.—His claim of priority (Med. News, July, 1886, p. 26) cannot be sustained.

§ R. Battey (Rome, Georgia). What is the field for Battey's operation? Paper read before the American gynæc. Soc. at Cincinnati, Sept. 1, 1880, cited by W. H. Byford. The practice of medicine and surgery applied to the diseases and accidents incident to women, 4th ed., Philadelphia, 1888, p. 676.

curable by establishment of the menopause? Really the whole difficulty lies in this last question. It is not sufficient that the ovary is very painful for the surgeon to be certain that it is the starting-point of the disease; such a condition as "hysterical ovary" is known; moreover, in every woman neuralgic pain may exist of central origin with centrifugal irradiations. Healthy teeth are often extremely tender in tri-geminal neuralgia, but nobody would think of extracting them.* To this just criticism of Olshausen it has been objected that, castration being by no means severe when the ovary is not diseased and the pain being extreme, many patients would consent to an operation which would offer them even a doubtful chance of cure. In any case it would have the effect of preventing the constant exacerbations which occur at every menstrual period.

For menstrual epilepsy Lawson Tait has obtained some highly encouraging cures. Nevertheless G. Willers, a pupil of Hegar, has collected a series of cases which shows that there is a greater chance of success if the ovaries be diseased than if they be healthy. The same holds good for hysteria and hystero-epilepsy with definite exacerbations at the monthly periods and an assumed or determined lesion of the ovaries.

If castration has yielded some successes† it has also many times been ineffectual.‡ Cures, of which some have been very remarkable, may be entirely lacking or may only be temporary.§ Then, too, one ought to consider whether they do not sometimes depend upon the powerful moral impression and the sort of suggestion that is produced by the operation. What proves definitely the power of the last mentioned is the happy result that has been exceptionally brought about by a simulated castration.‖

* Olshausen. Die Krankh. der Ovarien, 1886, p. 452.

† Heilbrunn, Walton, v. Hoffmann, Bircher, Hegar, &c. Cf. the literature at the end of the chapter.

‡ Playfair (B. M. J., 1891, p. 119) declares that castration in cases of hystero-epilepsy is a bad operation. Spencer Wells and Priestley agree with him. It seems to me, however, that Playfair is going too far when he says that "if the nervous condition is aggravated by inveterate ovarian disease, the nervous condition must first be systematically treated in the hope of avoiding castration."

§ Cases of J. Friedmann, L. Landau and Remak, A. Leppmann, Mundé, &c.

‖ J. Israel. Beitrag zur Würdigung des Werthes der Castration bei hysterischen Frauen (Berl. klin. Woch., 1880, No. 17, p. 243).—A. Hegar. Zur Israel'schen Scheincastration (Berl. klin. Woch., 1880, No. 48, p. 682).—Chiarleoni (Gaz. degli Ospit., 1888, Nos. 8 and 9), in a hysterical woman, æt. 29 (amenorrhœa, incontrollable

With regard to castration for mania or the psychoses, which seem to be influenced by menstruation, I think it ought to be unhesitatingly put on one side.* Cases have been published in which, far from obtaining an improvement, the condition has been aggravated. One cannot, either, adopt the view, which is to say the least a strange one, held by those surgeons who have performed castration with the object of inducing sterility and preventing the reproduction of hereditary insanity.†

In the preceding considerations I have not taken into account the anatomical condition of the ovaries. In spite of Hegar's very laudable attempt to restrict castration to cases in which lesions of the ovary can be definitely found, and to form an anatomical basis for the operation even when it is performed for nervous symptoms, there is no doubt that in the immense majority of cases‡ such a diagnosis is quite an impossibility. Sclero-cystic degeneration, fibrosis, and increase of the ovarian stroma are very rarely to be recognised by bimanual examination, and as to the symptoms that such lesions call forth, there is nothing to distinguish them from purely nervous disorders.

There seems to me to be no doubt that removal of even healthy ovaries has been able to modify the condition of the nervous system in such a way as to lead to the disappearance of serious reflex troubles which co-exist with the menstrual function. Consequently the surgeon has not so much to occupy himself with the question of the anatomical condition of the ovary, healthy or otherwise, as to satisfy himself that it is the physiological starting-point of the symptoms; examination of the rational symptoms here takes precedence over physical examination. But it must be confessed that it is extremely difficult to

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vomiting, extreme emaciation), simulated castration (superficial incision in the abdominal wall). Vomiting ceased at once, sleep and appetite returned. After a fortnight the patient got up. Menstruation appeared a month later.

* Spencer Wells. Modern abdominal surgery (read before Roy. Coll. Surg., Dec. 18, 1890), London, 1891, p. 35 and foll.

† W. Goodell. Removal of the ovaries in the treatment of confirmed masturbation and of ovarian insanity (New York Med. Record, Oct. 13, 1883, vol. 24, p. 402).

‡ Hegar (Hegar and Kaltenbach. Oper. Gyn., 3rd ed., 1886) tacitly recognises this fact when he writes: "We have several times obtained good permanent results from castration in cases in which careful examination has only shown, apart from slight peri-ovaritis, a simply hyperplastic condition of the stroma of the ovaries." These lesions, it is plain, are quite insignificant; and it is therefore as much as to say that castration has often succeeded after the operation has been performed upon healthy ovaries.

give an opinion, and without a perfectly formed conviction any conscientious surgeon would always recoil from an operation, which, when it is ineffective, is simply mutilation, and from a social point of view is much more serious than amputation of a limb.

Péan* prefers vaginal hysterectomy, which he calls "uterine castration," to ovarian castration, and has found it more successful as treatment for the nervous symptoms. I am somewhat inclined to share his view. Uterine castration acts, in point of fact, by suppressing to a greater extent the starting-place of morbid reflexes; in two cases I performed this operation, and in both of them obtained a remarkable cure.†

Method of performing castration.—I have already described this operation when dealing with the indirect treatment of fibroids, but a few special points must be mentioned here. The abdominal incision should be as small as possible, since only the ovary and tube have to be drawn through it, and there is no laborious search or difficult dissection necessary. Moreover, it can always be extended if necessary, as a rule 5 or 6 cm. is sufficient at the commencement. The position of the fundus of the uterus should be clearly made out by means of a bimanual examination, and the centre of the incision should be made over this part; the lower extremity of the wound is about two finger-breadths from the pubis as a rule. Battey, at any rate, in his earlier operations, only removed the ovary. Hegar,‡ from the very commencement, fully appreciated the importance of removing the Fallopian tube at the same time, and as a matter of fact this facilitates rather than complicates the operation. Lawson Tait§ considers this second point of capital importance, and has greatly contributed to transforming oophorectomy into salpingo-oophorectomy.

The scar left by a small incision, such as that practised by Lawson Tait, is quite insignificant, and especially if care be taken, as I have suggested, to suture the abdominal walls by three superposed layers of stitches, with two layers of hidden catgut stitches.‖

* Péan. Gaz. des Hôp., 1886, No. 145, p. 1170.

† S. Pozzi and Baudron. Rev. de Chir., Aug., 1891, p. 622.

‡ Hegar. Die Castration des Frauen, p. 112.

§ Lawson Tait. Diseases of the ovaries, Birmingham, 1885, p. 326

‖ S. Pozzi. Comptes rendus du Congrès français de Chir., 5th meeting, Paris 1891, p. 211.

From this point of view a vaginal incision offers scarcely any advantages. Nevertheless castration may be performed in this way to avoid a visible cicatrix when patients prefer it considerably,* and especially when the ovaries are prolapsed and easily accessible. Ovaries, prolapsed into Douglas' pouch, will easily be recognised by a vaginal examination, and also by two characteristic signs, pain during defæcation and pain during coitus.

When the uterus is freely movable the operation is extremely simple. The patient being in the dorso-sacral position, the fourchette is drawn downwards by a short Simon's retractor, the cervix is taken hold of and drawn forwards, while an assistant lowers the uterus by pressing upon the hypogastrium. A transverse incision, 4 cm. in length, is made in the posterior cul-de-sac as near as possible to the uterus. The first and second fingers are thrust into Douglas' pouch, the ovary and tube are hooked up, the hilum transfixed with a blunt needle, and a Tait's knot applied. It is better to remove the appendages on both sides, even if only one ovary is prolapsed, when the nervous symptoms are very severe, for the artificial menopause acts with much greater certainty than removal of the displaced organ alone. If the operation has been perfectly straightforward, and there be no special reason for drainage, the wound may be completely closed up by means of catgut stitches.†

* Bonnecaze. Value of and indications for the vaginal incision in removal of certain small tumours of the ovaries and tubes. Thesis, Paris, 1889.

† Below is some of the literature relative to recent work upon castration in cases of dysmenorrhœa especially accompanied by nervous and mental disorders. R. Battey. Extirpation of the functionally active ovaries for the remedy of otherwise incurable diseases (Trans. Amer. Gyn. Soc., 1876, vol. 1, p. 101-121.—Marion Sims, B. M. J., Dec., 1877, vol. 2, p. 793.—E. Börner. Wien. med. Woch., 1878, Nos. 47 to 50, p. 1247 and foll.—J. H. Aveling. The spaying of women. (Obst. Journ. of Gt. Britain, Jan., 1879, vol. 6, p. 617).—Spencer Wells. Case of removal of both ovaries for dysmenorrhœa (Trans. Amer. Gyn. Soc., Boston 1879, vol. 4, p. 198).—A. Hegar. Zur Castration bei Hysterie (Berl. klin. Woch., 1880, No. 26, p. 365).—Bruntzel. Arch. f. Gyn., 1880, vol. 16, p. 107).—Dawson. Amer. Journ. of Obst., 1881, vol. 14, p. 419.—Maurer. Deut. med. Woch., 1881, p. 530.—H. Klotz. Hysterie und Castration (Wien. med. Woch., 1882, Nos. 38 to 41, p. 1129 and foll).—W. Goodell. Amer. Journ. of Insanity, 1882, and Philad. Med. Times, Dec. 29, 1883, vol. 14, p. 229.—Jessett. Lancet, June, 1882, vol. 1, p. 910.—Leopold. Arch. f. Gyn., 1882, vol. 20, p. 88.—Fehling. Zehn Castrationen (Arch. f. Gyn., 1883, vol. 22, p. 441).—Mundé. Amer. Journ. of Obst., 1883, p. 944.—Carstens. Ibid., pp. 266 and 522.—Jos. Peretti. Berl. klin. Woch., 1883, No. 10, p. 141.—Landau and Remak. Zeitsch. f. klin. Med., 1883, p. 437.—G. Thomas. New York Med. Journ., Jan., 1883, vol. 37, p. 32.—B. Heilbrunn. Centr. f. Gyn., 1883, No. 38, p. 601.—Malins. B. M. J., May 12, 1883, p. 911.—J. Friedmann,

Vergleich einiger Fälle von Operationen an den Ovarien wegen Psychose. Inaug. Dissert., Berlin, 1883.—Tauffer. Beiträge zur Lehre der Castration der Frauen (Zeitschr. f. Geb. u Gyn., 1883, vol. 9, part 1, p. 38.—Lawson Tait. The pathology and treatment of diseases of the ovary, 4th ed., 1883, p. 328.—P. Müller. Beiträge &c. (Deut. Zeitschr. f. Chir., 1814, vol. 20, p. 1).—G. L. Walton. Boston med. and surg. Journ., 1884, vol. 110, No. 23, p. 529.—V. Hoffmann. San Francisco Western Lancet, Jan., 1884.—P. Flechsig. Neurol. Centralblatt, 1884, No. 19, p. 433, and No. 20, p. 457.—Bircher. Castration bei ovar. Neuralgie u. Hysterie (Corresp. Bl. f. Schweiz Aerzte, 1884, vol. 14, pp. 447 and 470).—A. Hegar. Arch. f. Gyn., 1884, vol. 24, p. 318, and Centr. f. Gyn., 1884, p. 593.—Der Zusammenhang der Geschlechtskrankheiten mit nervösen Leiden, 1885.—Zur Begriffsbestimmung der Kastration (Centr. f. Gyn., 1887, No. 44, p. 698).—Schmalfuss. Zur Castration bei Neurosen (Arch. f. Gyn., 1885, vol. 26, p. 1).—H. Menzel. Beiträge zur Castration der Frauen (ibid., p. 36).—A. Leppmann. Ibid., p. 57.—Tissier. Castration of women in surgery. Thesis, Paris, 1885.—Uherek. Die funktionellen Neurosen beim weiblichen Geschlecht und ihre Beziehung zu den Sexualleiden, in Frauenarzt, 1886 (anal. in Centr. f. Gyn., 1888, No. 4, p. 50).—L. Tait. B. M. J., 1886, vol. 2, p. 852.—A case of hystero-epilepsy successfully treated by removal of damaged uterine appendages (Lancet, 1887, vol. 2, p. 1213).—Schröder. Ueber die Castration bei Neurosen (Zeitsch. f. Geb. und Gyn., 1886, vol. 13, part 2, p. 325).—Widmer. Centr. f. Gyn., 1886, No. 40, p. 657.—Mundé. Amer. Journ. of Obst., March, 1886, vol. 19, p. 324, and Jan., 1888. vol. 21, p. 35.—Magnin. Castration in women as curative treatment for nervous troubles. Thesis, Paris, 1886.—J. Schramm. Ueber Castration bei Epilepsie (Berl. klin. Woch., 1887, No. 3, p. 38).—G. Willers. Ueber die Berechtigung der Castration der Frauen zur Heilung von Neurosen und Psychosen bei intactem Sexualsystem. Inaug. Dissert., Friburg, 1887.—Lucas-Championnière. Three cases of removal of the ovaries for nervous symptoms (Paris obst. and gyn. Soc. in Annal. de Gyn., 1883, vol. 27, p. 450).—E. W. Cushing. Melancholia, masturbation cured by removal of both ovaries (Journ. of Amer. Med. Assoc., Chicago, 1887, p. 441).—Reany. A case of oophorectomy for epilepsy (Amer. Journ. of Obst., 1888, vol. 21, p. 435).—F. Merkel. Beitrag zur Kasuistik der Kastration bei Neurosen. Nüremberg, 1888.—May. A case of hystero-epilepsy ; Tait's operation, cure (Virginia Med. Month., Richmond, 1888-9, vol. 15, p. 174).—Imlach. A case of hystero-epilepsy of 20 years' duration treated by removal of the uterine appendages (B. M. J., 1888, vol. 1, p. 140).—S. Brodnitz. Die Wirkungen der Kastration auf den Weiblichen Organismus. Inaug. Dissert., Strasburg, 1890.—Playfair. On removal of the uterine appendages in cases of functional neurosis (B. M. J., Jan. 17, 1891, p. 119).

BOOK IX.

INFLAMMATION OF THE UTERINE APPENDAGES.

General considerations.—Varieties in salpingitis.

The important part in gynæcology played by inflammation of what it has been agreed to call the uterine appendages (ovary and Fallopian tube), has only been definitely admitted of late years. Aran and his pupil Siredey * had clearly foreseen and pointed it out. But these important ideas, formulated by physicians and unprovided with the control and sanction of surgical interference, necessarily were passed over unnoticed. The important operations of Lawson Tait † have done more to make this truth generally known than all the considerations of physiology and pathological anatomy. New light has been thrown upon the vexed question of peri-uterine inflammations.‡

The interminable and nice discussion which wearied a whole generation, to wit, the question whether inflammation started in

* Aran. Clinical lectures on diseases of the uterus and its appendages, Paris, 1858. —Siredey. On the frequency of changes in the appendages in disease said to be of the uterus. Thesis, Paris, 1860.

Even in the last century, in France, the frequent propagation of inflammation of the uterus to the tubes and ovaries had been definitely noted.—Astruc. Treatise on Disease, 1770, vol. 6, p. 46.—Lieutaud. Details of practical medicine, 1776, vol. 2, p. 462.

† Lawson Tait. *Loc. cit.*, 4th ed. 1883 (French trans. by Olivier).—Hegar claims priority for operations on pyo-salpinx.—Cf. Wiedow. Zur operativen Behandlung des Pyosalpinx (Centr. f. Gyn., 1885, No. 10, p. 145).

‡ The words, peri-uterine, peri-ovaritis, ovario-salpingitis, are often used, and are sanctioned by custom in spite of the fact that their etymological composition is very defective, since they are hybrid combinations of Greek with Latin words: correctly they should be circum-uterine, circum-ovaritis, tubo-ovaritis, or better still, peri-metritis, peri-oophoritis, oophoro-salpingitis.

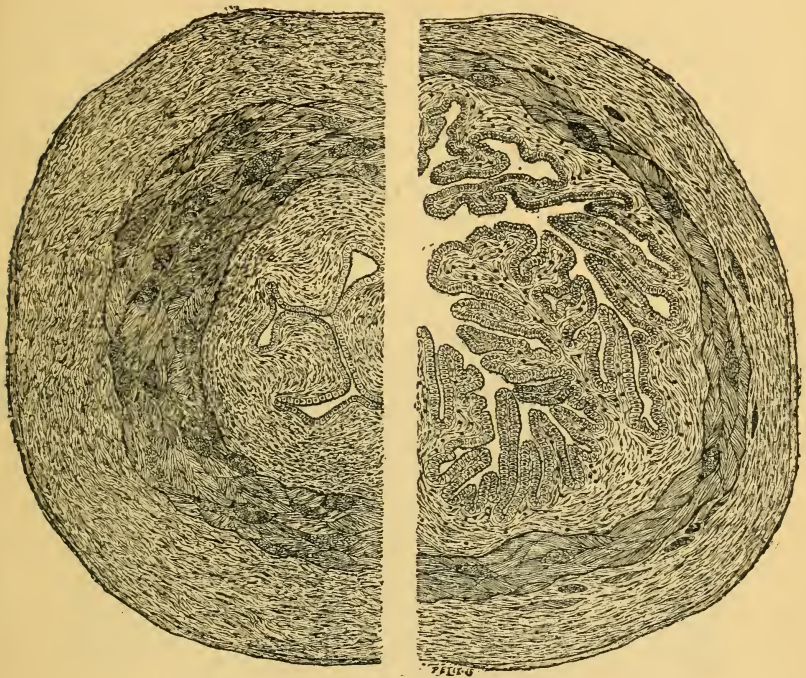

Fig. 312.—Fallopian tubes; normal.

Sections: A, close to the uterus; B, close to the fimbriated extremity (Wyder).

Succession of layers: 1. Above and outside the serous coat. 2. Layer of fasciculated connective tissue, loose and rich in vessels. 3. Muscular layer of greater thickness close to the uterus (uterine segment) than near the fimbriated extremity (abdominal segment). It consists principally of muscular fibres arranged circularly. Above and on the inner side it is mixed with bundles of muscular fibres arranged longitudinally, some of which spread out in the mucous coat; others (more external) penetrate between the two layers of the broad ligament; others again run to the hilum of the ovary or send prolongations over the fundus of the uterus; some fibres penetrate into the circular layer. 4. The mucous coat. The meshwork of this coat is formed of an embryonic connective tissue rich in fusiform cells; it projects into the lumen of the tube in longitudinal folds, which in the section have been cut more or less obliquely. In the neighbourhood of the uterus these folds are short and thick, and give a star-like appearance to a section of the lumen of the tube. Near the fimbriated extremity they become more elongated and give to the section a broken up and tree-like appearance. The whole surface of the mucous coat is covered by a single layer of cylindrical epithelium bearing cilia; in the living subject, the movement of these cilia is directed from the ovary towards the uterus.

the circum-uterine cellular tissue or in the neighbouring peritoneum, whether it was "peri-uterine phlegmonous inflammation" or "pelvic peritonitis," is now a matter of history only; the heated controversy on the subject between Nonat, Bernutz, Goupil, and Gallard, seems to us as much out of date as the debate between Gendrin and Lisfranc on "engorgement of the uterus" and "partial chronic metritis" to explain the same symptoms. Even the distinction between para-metritis and

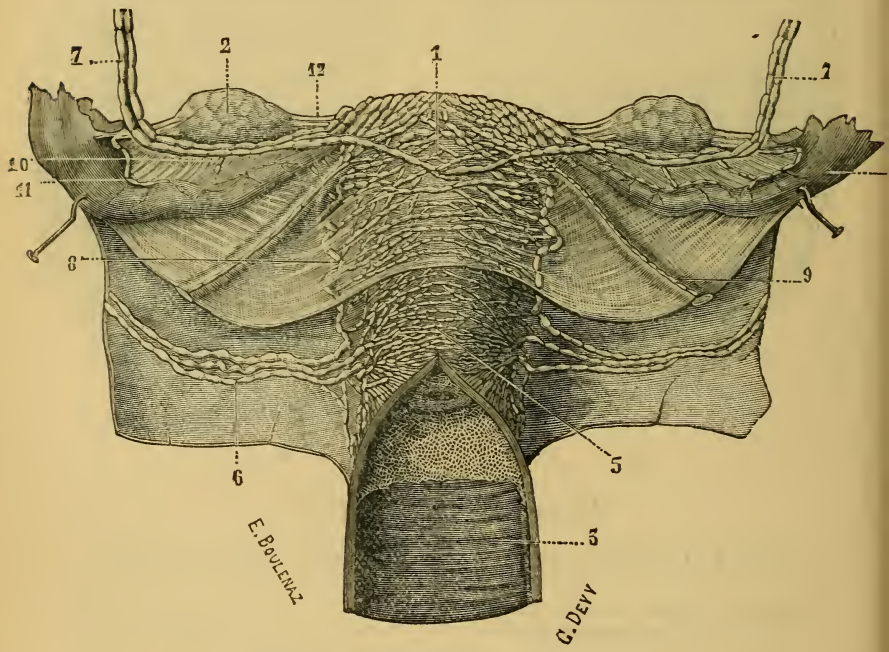

Fig. 313.—Lymphatics of the uterus (Poirier).

1. Lymphatics of the body and fundus of the uterus.—2. Ovary.—3. Vagina.—4. Fallopian tube.—5. Lymphatics of the cervix.—6. Lymphatics of the cervix running to the iliac glands.—7. Lymphatics of the body and fundus of the uterus running to the lumbar glands.—8. Large anastomosis of the uterine and cervical lymphatics.—9. Small lymphatic vessel in the round ligament running to the inguinal glands.—10, 11. Lymphatics of the tube emptying into the large lymphatic trunks of the body of the uterus.—12. Ligament of the ovary.

peri-metritis, which is kept up by writers of the present day, seems scarcely justified in clinical practice. It is a belated remnant of old doctrines.

For the thorough comprehension of the absolute one-ness of the uterus and the tubes, it must be remembered that they have

a common embryonic origin. At the end of the second month of intra-uterine life, Müller's ducts become fused below to form the uterus and vagina, while they remain separate above to form the Fallopian tubes. The latter are therefore only long drawn out prolongations of the uterine cornua. There is a perfect continuity of their various coats, and hence the possibility of an ascending salpingitis secondary to metritis in exactly the same way as there is an ascending pyelitis consequent upon an obstinate cystitis. The ovary, tied down to the tube by the

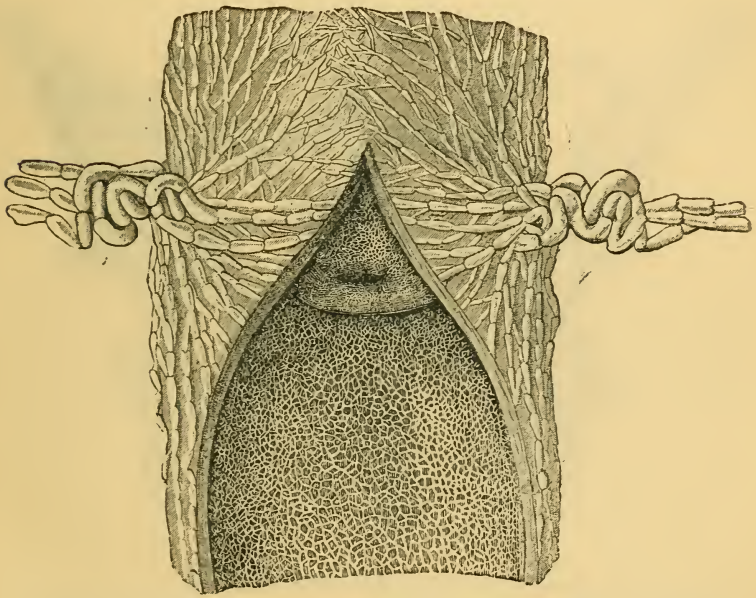

Fig. 314.—Lymphatics of the cervix and upper third of the vagina. (P. Poirier.)

tubo-ovarian ligament, and almost in direct contact with the fimbriated extremity, may in the same way be easily infected.

Further, these organs are connected closely together by important vessels and lymphatics. Thus there are the anastomoses of the utero-ovarian arteries and veins with the uterine arteries. Still more worthy of attention are the lymphatic connections. Lucas-Championnière has the honour of having laid stress thereupon after Cruikshank and Cruveilhier.* He has described, in

* J. L. Championnière. Uterine lymphatics, &c., Thesis, Paris, 1870. As regards Cruveilhier, the description of the lymphatics of the uterus must be sought in his

particular, at the angles of the uterus systems of superficial lymphatics, which lie in the broad ligament behind and below the Fallopian tube, between the tube and the round ligament, and especially below the ovary and tube. There exist also deep lymphatics, which form a second layer, that can only be seen by making a vertical cut into the uterine horn. We have here a remarkable lymphatic group which occupies the space between the tube and the ligament of the ovary, and important relations completing the already close anatomical relations, are thus

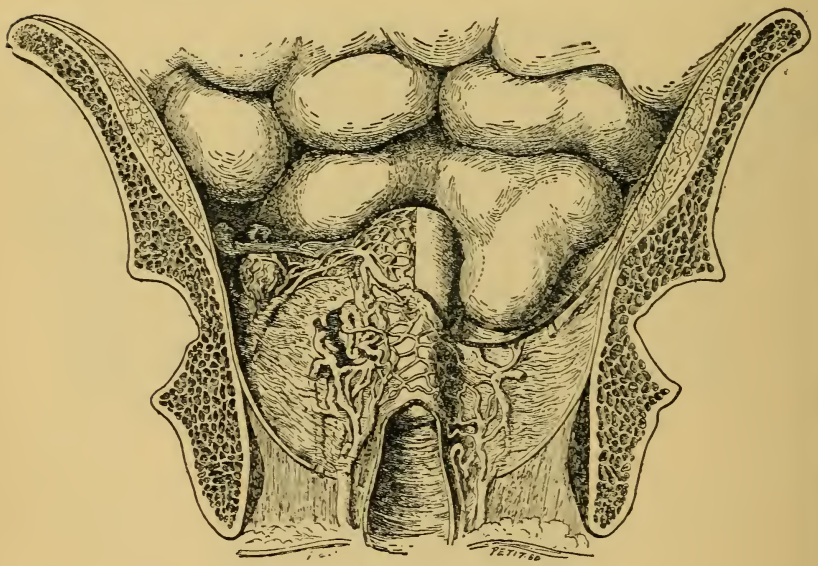

Fig. 315.—Vertical section of the pelvis, showing the superior pelvi-rectal space and the ischio-rectal fossa. (On the left the section passes through the broad ligament on the right, a little in front of it.)

established between the ovary and tube (fig. 313). Also it may be said there is no ovaritis without salpingitis, nor salpingitis without ovaritis. With very good reason, therefore, is inflam-

Pathological Anatomy, and not in his Descriptive Anatomy. The reason of this is because investigations on this point are far better carried out upon pathological cases, and in women who have died of puerperal fever, for in them the lymphatics have become more evident, by reason of the pregnancy and the inflammation. Cf. P. Poirier's interesting investigations on the part taken by the lymphatics in uterine inflammation (Prog. méd., 1889, No. 47, pp. 491 and 492, No. 48, p. 509 and foll., No. 49, p. 527 and foll., No. 52, p. 590 and foll.;—1890, No. 3, pp. 41 and 42, and No. 4, p. 65 and foll.).

mation of the appendages collected into one and the same description.

In almost all cases inflammation passes from the tube to the ovary directly by contact and adhesion. But sometimes suppuration occurs in the ovary, without any continuity with the inflammation in the tube. This fact can be explained by the lymphatic relations. For the vessels which leave the fimbriated extremity follow the external lateral ligament of the ovary, and empty themselves into the large lymphatic anastomosis that has been called the sub-ovarian plexus. There is, therefore, not the slightest difficulty in understanding that an abscess of the ovary may co-exist with relatively slight disease of the Fallopian tube.* A vehicle for inflammation that may also be present is adhesions, which, as Poirier has shown, are richly supplied with lymphatics.

Again, the lymphatic layer that covers the surface of the ovary communicates freely with that of the peritoneum; according to Waldeyer,† the whole layer of the abdominal serous membrane may be injected from the ovary in an artificial preparation. If therefore the peritonitis secondary to inflammation of these organs is generally so circumscribed, we must doubtless explain the fact by assuming that the first steps of the process consist in a plastic obliteration of the vessels in a kind of adhesive lymphatic thrombosis.‡

Lastly, the sub-peritoneal cellular tissue which is found in the expansions of the tubes and ovaries is a prolongation of that of the broad ligaments, which itself is continuous below, over the

* Quénu. Bull. et Mém. Soc. de chir., Dec. 12, 1888, p. 954.

† Waldeyer. Eierstock und Ei. Leipzic, 1870.

‡ According to Wallich's researches upon the sub-serous lymphatic system of the uterus during pregnancy, this system is formed of a great number of capillary vessels. These vessels, far more numerous than the blood capillaries, are arranged in several layers; they are in communication with the superficial lymphatic capillary vessels of the muscular layer, and they end partly in larger trunks and partly in a special vascular system. Normally of small size, during pregnancy these trunks become larger, but they do not attain to the proportions that have been observed when the uterus is affected with puerperal lymphangitis, during the involution period. The lymphatic capillaries are also in communication with a very fine vascular system formed by trabeculæ and spaces of variable shape, and lined, similarly to the lymphatic capillaries, by cells with dentate contour (fig. 316). Consequently the lymphatic system acquires a great importance in the sub-serous portion of the uterus, and these newly discovered anatomical facts may help us to understand a certain number of pathological facts. V. Wallich. Researches on the sub-serous lymphatic vessels of the gravid and unimpregnated uterus. Thesis, Paris, 1891.

pelvic roof and on the sides, with the more or less fat-containing layer of tissue which lies outside the peritoneum, and which is particularly loose in front of the bladder, where it forms the pseudo-cavity of Retzius (fig. 315).

A knowledge of these particulars is necessary to explain the superficial and deep propagation of the inflammation.

The classifications of salpingitis that have been given differ very considerably.

Cornil and Terrillon* recognise :—

1. Vegetating catarrhal salpingitis.
2. Purulent salpingitis (pyo-salpinx).

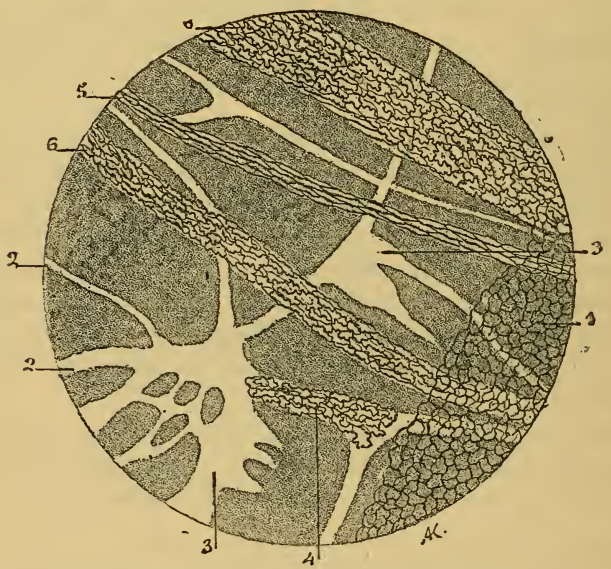

Fig. 316.—Superficial sub-serous layer of an unimpregnated uterus, slightly enlarged (Wallich).

1. Peritoneal endothelium.—2. Clear bands.†—3. Stellate spaces.—4. Dentate cells of the wall of the clear bands.—5. Capillary, with elongated cells forming its wall.—6. Large lymphatic vessels with dentate cells forming their walls.

3. Hæmorrhagic salpingitis (hæmatoma of the tube, hæmo-salpinx).
4. Gonorrhœal salpingitis.
5. Tubercular salpingitis.

* Cornil and Terrillon. Arch. de physiol., 1887, 3rd series, vol. 10, p. 533.

† Wallich (*loc. cit.*) designates by this name the spaces brought into view by nitrate of silver and bearing dentate cells at certain points ; very probably they form a system of lymphatic spaces situated outside of the capillaries.

This division is incomplete, as it leaves on one side certain forms of diffuse interstitial inflammation that are met with in chronic affections. It is slightly defective in that it separates purulent salpingitis from tubular and gonorrhœal salpingitis, which are after all only simple varieties of purulent salpingitis.

Orthmann* describes the following classes :—

1. Catarrhal salpingitis, with the varieties, simple, diffuse, interstitial, hæmorrhagic, follicular.
2. Purulent salpingitis, which may be septic, gonorrhœal, or tubercular.
3. Hæmato-salpinx.
4. Hydro-salpinx.
5. Pyo-salpinx (or cystic purulent salpingitis).

From a combined clinical and anatomical standpoint I think it is necessary first of all to divide inflammations of the tubes into two great classes according as they do or do not tend to the formation of encysted tumours. We shall therefore consider :—

I. Non-cystic salpingitis
- *a.* Acute catarrhal
- *b.* Acute purulent
- *c.* Chronic parenchymatous (pachy-salpingitis)
  - *a.* Hypertrophic or vegetating variety
  - *b.* Atrophic or fibrotic variety

II. Cystic salpingitis
- *a.* Hydro-salpinx
- *b.* Hæmato-salpinx
- *c.* Pyo-salpinx

I do not here introduce any question of ætiology, for a gonorrhœal salpingitis, for example, may appear under the most varied forms, *e.g.*, purulent non-cystic, purulent cystic (pyo-salpinx), which may itself finally become converted into hydro-salpinx, or end in the formation of a parenchymatous salpingitis.

Lesions of the ovaries are generally bound up with lesions of the tubes. Clinically it is very difficult to describe an ovaritis which is not a tubo-ovaritis. And that is the reason why I have thought it advisable to subordinate inflammation of the ovary to that of the tube, from a nosological and clinical point of view. An exception, however, as will be seen later on, may perhaps be made in the case of fibro-cystic ovaritis, which some-

* E. G. Orthmann. Beitr. zur normalen Histologie und zur Pathologie der Tuben (Virchow's Arch., 1887, vol. 108, p. 165).

times exists independently of salpingitis and arises from special nutritive troubles, functional and diathetic.*

* From a purely histological point of view, according to Paul Petit, who has made the subject a special study, the following might be the correct classification of ovaritis :—

- Non-cystic ovaritis
  - Acute
    - Cortical
    - Diffuse
  - Chronic
    - Cortical
    - Disseminated
    - Hypertrophic
    - Sclero-cystic
    - Atrophic
- Cystic ovaritis
  - Serous cysts
    - By follicular dropsy
    - By interstitial dropsy
  - Blood-cysts
    - Of the follicles
    - Of the corpora lutea
    - Of the stroma
  - Cysts containing pus
  - Cysts from lymphangiectasis

CHAPTER I.

Oophoro-Salpingitis without Cystic Tumour.

Pathogenesis. Ætiology. Hetero-infection. Gonorrhœa. Parturition, abortion. Mixed infection. Septic examination. Auto-infection. Tuberculosis. Exceptional causes.—Pathological anatomy. I. Lesions of the tube: Acute catarrhal purulent, chronic parenchymatous with hypertrophic and atrophic varieties. II. Lesions of the ovary: Ovaritis, micro-cystic degeneration, sclerosis.—Symptoms. Tubal pains. Disorders of menstruation. Tumours of the appendages.—Diagnosis from ovaritis, lumbo-abdominal neuralgia, metritis. Question of the preponderance of the ovaritis or the salpingitis; the cystic salpingitis; the peri-salpingitis.—Course and prognosis. Exacerbations, foci of inflammation, peri-uterine pseudo-adenitis, sterility.—Treatment. Indirect intra-uterine medication. Electricity. Massage. Oophoro-salpingotomy (Lawson Tait's operation). Simple breaking down of adhesions (Hadra's operation). Expression of the tubes (Polk's operation). Salpingostomy. Statistics of salpingotomy.

Pathogenesis. Ætiology.—Does such a thing exist as a primitive ovaritis, being the initial and original lesion, dependent upon disorders of menstruation or venereal excesses, and quite independent of all antecedent infection or lesion of the uterus and tubes? Dalché and Prochownick* have recently again supported its existence, but without sufficient proof. It seems to me extremely doubtful, excepting in some rare cases of fibro-cystic ovaritis of diathetic and functional origin.† In the vast majority of cases ovaritis depends upon a previous endometritis or salpingitis; no doubt one or other of these stages may have quite passed away without leaving any permanent anatomical

* Dalché. On ovaritis. Thesis, Paris, 1885.—L. Prochownick. Arch. f. Gyn., 1887, vol. 29, part 2, p. 183.

† There are some special predisposing causes of ovaritis. I should be inclined to consider that in the production of fibro-cystic lesions of the ovary, an important part is played by the rheumatic diathesis, chills during menstruation, venereal excesses, and also by that dilatation of the veins of the true pelvis which constitutes tubo-ovarian varicocele. The last I have been able to verify in three cases: one of them has been well described by Paul Petit. Bull et Mém. de la Soc. obst. et gyn. de Paris, June, 1891. Cf. also on this varicocele: Dudley. New York Medical Journ., Aug. 11 and 18, 1888, vol. 48, pp. 147 and 174.—H. Coe. Amer. Journ. of Obst., March, 1889, p. 504.

signs, but consideration of the previous history will always evidence their former existence.

I therefore prefer to use the terms tubo-ovaritis and oophoro-salpingitis, and if I chance to shorten them into ovaritis or salpingitis the reader must bear in mind that a mixed lesion is always referred to.

Without a shadow of doubt, inflammation of the uterus is the chief cause of inflammation of the appendages. Centuries ago Postello* compared the abdominal end of the tube to the epididymis, and recently Bernutz† clearly drew up the points of resemblance between gonorrhœal tubo-ovaritis and gonorrhœal epididymo-orchitis. The infection, be it specific or otherwise, usually takes place by continuity of tissue, from one point of the mucous coat to another, in fact Schröder only recognises this mode of propagation, and most of the speakers at a discussion at the Surgical Society (of Paris) supported the same view.‡ J. L. Championnière,§ almost alone, spoke in favour of its constant propagation by the lymphatics, which at first he had only allowed to occur in puerperal cases. He lays particular stress upon the relative immunity of the uterine extremities of the tubes, even in cases where the external two-thirds have undergone marked alteration. An answer to this is that the immunity is apparent only and not histological, for under the microscope it may here be seen to be much inflamed although it appears really healthy to the naked eye. Moreover, similar conditions occur in the various lesions propagated from the bladder to the ureters and kidneys. Nevertheless the part played by the lymphatics cannot be neglected by any means. The frequency of adhesions uniting the fundus of the uterus to the appendages is known to be great. Now these adhesions (as Poirier has shown) are almost entirely formed of lymphatic vessels forming a communication between the sub-endothelial layer of the uterus and the lymphatics of the appendages. There is no doubt that these adhesions are the result of an antecedent metritis, which has acted upon the deep lymphatic layer, of which the sub-endothelial

* Postello (Professor of Medicine in the University of Cordova). Acta eruditorum Lipsiæ (1692), vol. 3, p. 140.

† Bernutz. Clinical lectures on dis. of women, Paris, 1888.

‡ Trélat, Terrillon, Quénu, Routier. Bull. et Mém., Soc. chir., Dec. 1888, p. 862 and foll.

§ J. L. Championnière. Ibid., p. 927.

network is but the continuation. By this way inflammation of the body of the uterus may proceed to infect the tubes and ovaries, particularly if some fresh pathological influence arises to give it a fresh stimulus.

Be that as it may, if a catarrhal endometritis last for even a short time, the tubes become more or less affected, but the symptoms are here too little marked to draw the attention of the practitioner to the epi-phenomenon. When one has to do with an intense metritis, coupled with slight salpingitis, the former alone is considered and treated. And on the other hand when the salpingitis is severe, a slight metritis, although it is the starting-point of the tubal affection, may easily be passed over unnoticed.

The frequency of endometritis affords an explanation of the frequency of diseases of the tubes, and the more so since an obstinate salpingitis is a very common result of a passing metritis. Winckel,* out of 575 autopsies on women, found more or less marked lesions of the appendages in 182. Lewers,† out of 100 autopsies made at the London Hospital found hydro-salpinx, pyo-salpinx, or hæmato-salpinx on 17 occasions. Galabin, from 1883 to 1886, found at Guy's Hospital 12 cases out of 302 autopsies, or 4 per cent. According to a statement of Lawson Tait, the latter hospital draws its patients from a better class than the London Hospital, and gonorrhœal and puerperal infection are less common there.

Gonorrhœal infection is the most common cause of inflammation of the Fallopian tubes, according to Nöggerath, who took up the question after Record, Requin, and Bernutz,‡ and according to Zweifel § and de Rosthorn. These writers attach peculiar importance to inoculation with what might be called attenuated gonorrhœal virus, such as a gleet the result of an old gonorrhœa, the remains of which are often neglected, and considered as

* F. Winckel. Lehrb. der Frauenkrank. Liepzig, 2nd edit., 1890.

† Lewers. On the frequency of pathological conditions of the Fallopian tubes (Trans. Lond. Obst. Soc., 1887, vol. 29, p. 198).—Discussion by Galabin, Lawson Tait.

‡ Requin. Elements of pathological medicine, 1846, vol. 11, p. 201.—E. Nöggerath. Ueber latente und chronische Gonorrhoe beim weiblichen Geschlecht (Deut. med. Woch., 1887, No. 49, p. 1059).

§ P. Zweifel (Arch. f. Gyn., 1891, p. 371) found the gonoccus in 8 cases, and streptococci in 3 cases (p. 375), and in 1 case diplococci. According to him, gonorrhœa is accountable for a large majority of cases of salpingitis.—A. v. Rosthorn. Ueber die Folgen der gonorrhischen Infection bei der Frau. (Prag. med. Woch., 1892, Nos. 2 and 3).

incurable and harmless. A considerable number of newly-married women would thereby be infected, and the so-called fatigue of the honeymoon would be much less responsible than has hitherto been supposed. Slight endometritis and intense catarrhal salpingitis are often produced in this way, of which the result is abortion, which aggravates the condition of the young woman, leaving her, perhaps, suffering and sterile.

Gonorrhœal infection sometimes sets up much more serious conditions, and may from the very first lead to suppuration of the tubes, which becomes encysted, or becomes propagated to the true pelvis.* This is the form which Bernutz has particularly described, and which I, like himself, have often seen in the wards of my hospital. In one case I have seen a perfectly fulminating gonorrhœal pyæmia arise, with multiple and independent foci of suppuration scattered throughout the sub-peritoneal cellular tissue and in the thickness of the mesentery. There was present intense vaginitis with pyo-salpinx.

The presence of Neisser's gonococcus cannot always be demonstrated, even when the gonorrhœal origin of the affection is indubitable. It has, however, been found a certain number of times.†

Puerperal infection, following on parturition, and particularly upon an abortion occurring under septic conditions, must be placed in the very first rank among the causes of inflammation of the appendages. In women affected with gonorrhœa at the time of parturition there occurs, seemingly, a kind of mixed ‡

* Ad. Schmidt. Zur Kenntniss der Tubengonorrhoe (Arch. f. Gyn., 1889, vol. 35, part 1, p. 162).—P. Charrier. Gonorrhœal peritonitis in women. Thesis, Paris, 1891.

† F. Westermark. Centr. f. Gyn., 1886, No. 10, p. 157.—E. G. Orthmann (Berl. klin. Woch., 1887, No. 14, p. 236) only found the gonococcus in the pus and not in the wall of the tube.—Menge (Centr. f. Gyn., 1890, p. 81, supplement) three times found Neisser's gonococcus in 26 cases of definite gonorrhœal salpingitis, but did not succeed in obtaining cultivations.

‡ Gerheim (Ueber Mischinfection bei Gonorrhoe, in Verhandl. der phys. med. Gesells. zu Würzburg, 1888, vol. 21) asserts that the gonorrhœal complications occurring in the internal generative organs are always mixed infections, in which the gonococcus only opens the door, so to speak, for other micro-organisms. As a matter of fact, the gonococcus can only develop upon cylindrical epithelium (Bumm's experiments), and injections of it into the cellular tissue give no results (Rinecker's experiments). Gerheim declares that in addition other germs present at the same time have often been confounded with Neisser's gonococcus in the complications of gonorrhœa, and especially an organism which greatly resembles it, which was discovered by Bumm, and which is a diplococcus of a yellowish-white colour; diplococcus aureus and albus add to the confusion.

puerpero-gonorrhœal infection, and this explains the great frequency of metro-salpingitis under such conditions. It is particularly in metritis *post-abortum*, with retention of shreds of placenta, that the slow supervention of disease of the tubes is to be feared, and this is not one of the least reasons why it is preferable to actively interfere (use of the blunt curette and irrigation), instead of adopting an expectant attitude or of resorting to mild measures, as some surgeons still advise. Recovery after these latter methods is often apparent only, and the woman who has kept for several days in her uterus decomposed shreds of membranes or placenta is almost infallibly destined to become the subject of metro-salpingitis.

Infection from local examination and obstetrico-surgical interference.—I may refer the reader to what I have said on this subject in the chapter on metritis. The sound has been the cause of many victims; division of the cervix, in pre-antiseptic days, was also accountable for many cases. Even at the present time it must be borne in mind that if intra-uterine examination is to be shorn of all danger, not only must the instrument or the finger be surgically clean, but also the cervical canal must be freed by repeated douches, from the micro-organisms that it normally contains.*

The existence of a constant cause of contamination in the cervical canal (Winter) may also explain the production of that form of metritis and salpingitis which has no other evident ætiology beyond a hindrance to evacuation of the cervical secretions as the result of misplacement or stenosis. Normal drainage of these mucous liquids, charged with micro-organisms that are virtually pathogenic, not being easily accomplished, reflux takes place towards the uterine cavity, after dilatation, often very marked, of the cervical canal itself has occurred. Auto-infection might thus arise. In any case there is no doubt that inflammation of the uterus and its appendages is moderately common under these conditions.† Tubercular salpingitis may co-exist with other similar lesions of the generative apparatus, and, so to speak, be lost in the midst of the other lesions. But

* G. Winter. Die Mikroorganismen im Genitalcanal der gesunden (Frau Zeits. f. Geb. u. Gyn., 1888, vol. 14, p. 443).

† W. Gill Wylie. Med. Record, New York, Jan. 24, 1885, vol. 27, p. 85.

in very many cases, as was long ago noticed, tuberculous salpingitis is an isolated condition.*

Is it to auto-infection or to hetero-infection (by introduction of tubercular semen into the generative tract) that this tubercular salpingitis, the frequency of which is perhaps greater than is generally supposed, must be attributed?

In some cases the point of entrance for the tubercle bacillus certainly seems to have been the generative tract (Cohnheim, Verneuil).† Nevertheless a certain number of cases of tuberculosis of the appendages occur in virgins, which cannot be explained upon this hypothesis, whatever may have been said to the contrary. In these cases it seems probable that an ordinary septic auto-infection has been induced by stenosis of the cervix, and that later the tubercle bacillus entering into the circulation through the respiratory or the digestive tract, has become engrafted upon the tubes as being a place of less resistance. This hypothesis is in accordance with the ideas that are gaining ground in general pathology with reference to what has been called pre-tubercular inflammation.

Malformation and congenital atrophy of the tubes also are true predisposing conditions to disease of the organs; they have been pointed out by Lawson Tait,‡ and Freund§ has particularly drawn attention thereto.

I only mention in passing the rare influence of the exanthemata,‖ notably scarlatina and variola, which has been fully established by Lawson Tait, and that of the very problematical contagion of genital papilloma,¶ which was brought

* Brouardel. Tuberculosis of the female genitals, Thesis, Paris, 1865.—Cayla. Bull. Soc. anat., 1881, p. 350.

† Cf. Verchère. Thesis, Paris, 1884.—Derville. Thesis, Paris, 1887.

‡ Lawson Tait. B. M. J., April 16, 1887, p. 825.—The writer expresses himself thus: "To these various causes of tubal inflammation, I am inclined to add another, which needs to be further studied with relation to its mode of action, but which furnishes indications that are far too evident to be passed over in silence. I have observed a considerable number of cases forming a distinct group, cases in which the sole explanation that could be given of the production of a chronic inflammation of the appendages was the persistence of an infantile condition of the uterus, due to arrest of development. In these cases, as a rule, the uterus was retroverted, completely fixed, and the appendages, increased in size, could be felt by the finger on each side. The uterus itself was invariably infantile; the condition of the appendages was completely altered by the inflammatory lesions."

§ Freund. Volkm. Samml. Klin. Vortr., 1889, No. 323.

‖ Lawson Tait. *Loc. cit.*

¶ Alban Doran. Trans. Obst. Soc. Lond., 1886, p. 229.

forward by Alban Doran to explain a case of papillomatous salpingitis, the exact nature of which remains uncertain.

The cases of syphilitic salpingitis that have been related do not bear criticism.* Further observations on the subject are necessary. The salpingitis of actinomycosis† is only an anatomical curiosity.

I was the first‡ to recognise the intestinal origin of some cases of oophoro-salpingitis. I have seen three cases in which, all other cause being wanting, infection of the tubes seemed clearly to date from some old lesion of the intestine (enteritis, enteric fever). Inflammation would extend either along the adhesions, uniting the appendages to the inflamed vermiform appendix, or along the lymphatics that Clado§ has described as forming a communication between this part and the ovary.

Pathological anatomy.—I. *Lesions of the tubes.*—These are much more constant and characteristic than those of the ovaries, at least in the acute forms; their mucous coat is, in point of fact, more vulnerable than the serous covering of the ovary.

The comprehensive expression "catarrhal salpingitis" has been greatly misused. All non-purulent inflammations of the tubes, from slight simple salpingitis, the accompaniment of an endometritis, by whose cure it is very likely itself to be cured, down to hypertrophic pachy-salpingitis with its luxuriant overgrowth of the folds of the mucous membrane and excessive thickness of the walls, have been thrown pell-mell into this category. This confusion greatly increases the difficulty of forming a true judgment upon the therapeutic value of the various operative results that have latterly been published in France and abroad. Since, in the eyes of some surgeons, it is only necessary for a tube to be slightly increased in size and more or less congested for it to be "salpingitis," and therefore condemned to removal, one is cautious in allowing the value of some brilliant series of cases. As a matter of fact, they do not demonstrate anything beyond the unquestioned simplicity and the absolute harmlessness of castration when performed with

* Monprofit. Salpingitis and ovaritis. Thesis, Paris, 1888.

† Cf. Ad. Zehman. Ueber die Actinomycose des Bauchfel's und der Baucheingeweide beim Menschen (Med. Jahrb. der Ges. der Aerzte, in Wien., 1883, p. 477, case 4).

‡ S. Pozzi. Bull. et Mém., Soc. Chir., Dec., 1890, vol. 16, p. 779.

§ Clado. Gaz. des hôp., Feb. 6, 1892, p. 150 (Biological Society).

antiseptic precautions. To be of real value it is indispensable that every case of extirpation of the appendages should be accompanied by a short but precise account of the lesion present, instead of being simply justified on the grounds that it is the usual custom. I also think that a careful distinction should be made between acute catarrhal salpingitis and chronic salpingitis with exacerbations (parenchymatous salpingitis); these have often been confused under the common name of vegetating catarrhal salpingitis, in consequence of insufficient attention having been given to the clinical history of the patients from whom the microscopic specimens were taken. A point that makes this confusion still easier is that many women are operated upon for an old lesion immediately after some exacerbation, which makes the exact chronology of the case uncertain.

In acute catarrhal salpingitis hypertrophy of the tube is first discovered making the part a cylinder the thickness of the little finger, not only by the infiltration of its wall, but also by that of the sub-serous tissue. Its fimbriated extremity is sometimes spread out and turgescent, more often folded in upon itself like a closed sea-anemone or the unopened flower of a daisy. But agglutination of its fimbriæ does not go as far as to the obliteration which occurs in chronic lesions. Permeability of the open extremity, to my mind, is pathognomonic of an inflammation that is simply catarrhal, that is to say, superficial and curable, and not necessitating removal. False membrane, generally thin, soft, lamellar, or filamentous, leaving the blood-vessels visible by reason of its transparency, sometimes connects the tube to the ovary or the neighbouring parts. The surface of the tube is rose-pink, the open extremity of a brighter colour. On section the cavity is seen to be filled with hypertrophied normal folds, pinkish or silver-grey, and these give it an appearance of vegetations; sometimes mucus is extruded on the surface.

Microscopical examination* shows that these lesions are particularly marked in the mucous coat; the folds are covered with lateral buds of new formation, instead of being thin and thread-like they are thick and have club-shaped terminations. Many of them anastomose with neighbouring processes, and form arches which gives a reticulated appearance on section.

* E. G. Orthmann. Virchow's Arch., 1887, vol. 108, p. 165.—Cornil and Terrillon. Arch. de physiol., 1887, p. 529 and foll.

The framework of these vegetations is cellulo-vascular infiltrated by embryonic cells; a layer of cylindrical epithelial cells with vibratile cilia covers them in places. In the fibro-muscular layer there is but little change, hyperplasia of its constituent elements alone being present.

Acute purulent non-cystic salpingitis is seen much less frequently than the encysted form or pyo-salpinx, to which it infalliably leads if it exist in any degree of acuteness, and if the

Fig. 317.—Acute catarrhal salpingitis (Transverse section in the middle of the tube x 10).

a b, leaf-like vegetations springing from a thickened fibro-vascular trabecula which passes from the wall to the centre of the tube—the villi and parietal folds often anastomose with one another and form pseudo-glandular cavities, *f*; *p*, fibro-muscular wall of the tube; *v v*, vessels (Cornil).

pus cannot find a free exit through the uterine orifice of the tube. According to Freund,* this unfavourable condition is always connected with incomplete development of the tube. He says that he can distinguish two kinds of tubes in the healthy woman: the first nearly straight and of normal calibre; the

* Freund. Samml. klin. Vorträge, 1889, No. 323.

second contorted and constricted in places, a remnant of the infantile condition. In the first class tubal affections run their course rapidly, and may be recovered from without treatment. In the other, suppurative inflammations necessarily terminate in the formation of cysts from the narrowness of the oviduct. This unfortunate conformation may be suspected when the patient

Fig. 318.—Acute purulent salpingitis. Transverse section (x 12).

f, *f*, thickened vegetations uniting largely with one another and leaving between them narrow spaces of a pseudo-glandular appearance; *p*, wall of the tube; *v*, vessel. (Cornil.)

has a delicate complexion, and has had dysmenorrhœa from the very commencement of menstruation.

This consideration may possibly have to be taken into account, but as a general rule it is undoubtedly sufficient for the inflammation to be very acute, and there will occur, not only a protective occlusion of the abdominal ostium, but also swelling and infiltration of the walls, such that the lumen of the tube becomes

obliterated, or, at any rate, ceases to be permeable on the uterine side. This series of events is very common in gonorrhœa.

Under any circumstances transformation into pyo-salpinx is always preceded by a profluent stage of acute purulent salpingitis, by which is meant that there is always a stage at which the ostium uterinum is permeable, and a free discharge of the purulent secretion occurs. When one operates during the existence of this condition, one finds all the signs of an intense inflammation of the tube; swelling, contortion of shape, and even a bossy or knotted appearance of the duct; the fimbriæ are stuck together so as to close the abdominal ostium, and if it be cut into, pus is found in the canal, which is moniliform in shape, owing to constriction at various points. The pus, creamy-like pus of recent formation, may empty itself into the uterus through the internal orifice, which has remained permeable, while the external orifice has been obliterated by fusion of the fimbriæ. The mucous membrane of the tube is swollen and greyish. The microscope shows in a transverse section very thick folds, covered with anastomosing buds and forming a system of primary and secondary folds, the fusion of which produces irregular cavities that look like glands. This thickening is due to the abundance of the migratory cells that infiltrate the connective tissue meshwork. The vibratile cilia of the cylindrical epithelium of the mucous membrane have, almost everywhere, fallen off, and the epithelial cells have lost their shape, becoming cubical or flattened, and only preserve it in the spaces between the folds. Here the blind extremities of the clefts are covered by an ill-formed cylindrical epithelium, which causes them to resemble segments of glands (fig. 318). The whole thickness of the wall, moreover, is infiltrated by round migratory cells, and the vessels are large and dilated (Cornil). When purulent salpingitis does not become converted into pyo-salpinx, it may become cured spontaneously, as is proved by clinical observation.

Retrogression of the process is rare, and during its whole duration the patient is exposed to the risk of the reappearance of acute phenomena. When retrogression occurs, the recovery takes place by induration, as used formerly to be said, and that means, by the formation of an embryonic cellular tissue which ends in, at any rate temporary, hypertrophy of the tube, or pachy-salpingitis.

Cornil has described a good case of purulent salpingitis in which this process seems to be going on (fig. 319). The vegetations primarily isolated are becoming united and forming an embryonic tissue, which at the first appears to be homogeneous. From this it results that we have a layer of newly-formed tissue which lines the lumen of the tube and narrows its calibre, while at the same time it presents on the free side small prominences

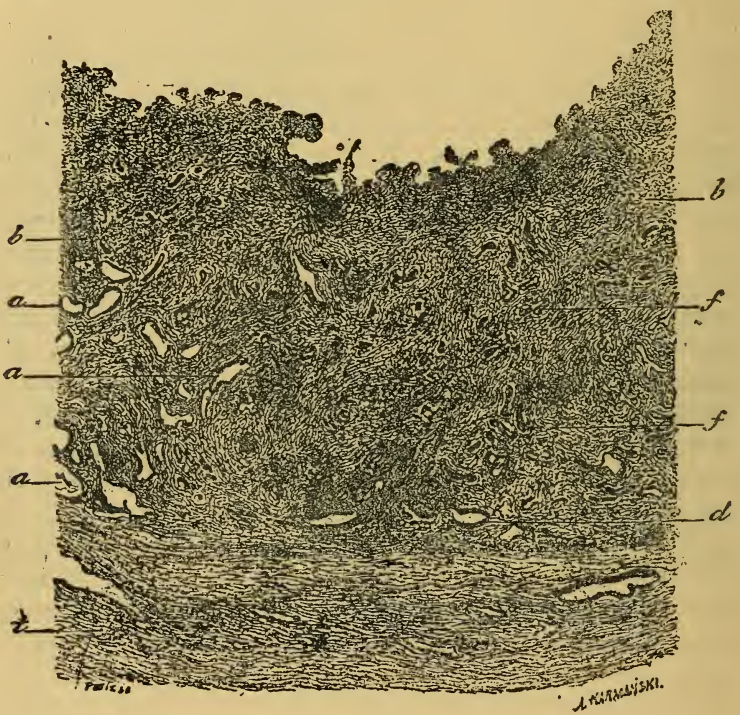

Fig. 319.—Acute purulent salpingitis. Transverse section (x 12).

t, connective tissue of the wall; *v*, vessel. Above the connective tissue is a thick layer of embryonic tissue, *b b*, through which cavities, *a a*, are scattered. These bear a lining layer of epithelial cells; *f f f*, narrower clefts, also containing epithelial cells; *d*, cavities of a similar nature close to the wall of the tube. (Cornil.)

like papillæ, formed either by embryonic tissue or by fleshy buds. When the pus has disappeared, and the young vegetations have become organised, then chronic salpingitis becomes developed.

In chronic parenchymatous salpingitis * both tubes are invariably affected, though very acute or slight lesions may be unilateral. This peculiarity has led Lawson Tait † to give, as a radical rule, the precept to remove both sets of appendages, the second being almost infallibly destined to undergo some change after the first has become affected. Most generally also, distinct lesions may be seen on the side of the ovaries (peri-oophoritis, fibrosis). In the majority of cases very strong adhesions bind down the appendages to the wall of the pelvis or to Douglas' pouch. Sometimes these adhesions become so firm that it is only by tearing them apart that the ovary and tube can be freed, and the latter themselves often become fleshy and friable. The thickened tube sometimes becomes as hard as a piece of whipcord.

The lesion, instead of being limited to the mucous membrane, as in the previous forms, invades the whole thickness of the wall. In fact it may even be said that the change in the middle layer of the parenchyma is now the most important. Chronic salpingitis, therefore, even to a greater degree than is the case with chronic metritis, is essentially parenchymatous, and from this peculiarity I have thought fit to give it its distinctive name. On section, great thickness of all the walls is found, the mucous coat is slatey in colour, the fimbriated extremity is always obliterated, and sometimes is adherent to the ovary. The uterine extremity, on the other hand, is generally patent, but the lumen of the tube has often also been obliterated at various spots.

This lesion has also been called "pachy-salpingitis" and "interstitial salpingitis," on account of the great proliferation of connective tissue that is revealed by the microscope. It is the analogue of chronic epididymitis, with fibrous transformation of the cord.

Two varieties of parenchymatous salpingitis, corresponding fairly well with the two varieties seen in parenchymatous salpingitis, may be distinguished. In the first, a good example of which was some time ago described by Kaltenbach, while

* I believe I was the first (in my first edition, August, 1890) to use this term, which has since been adopted by many writers.

† Lawson Tait. On the unsatisfactory results of unilateral removal of the uterine appendages (Birm. Med. Rev., 1887, p. 115).—B. M. J., 1887, vol. 1, p. 1211.

Schauta and Sawinoff* published some cases later, and I myself have seen some preparations, there is chronic hypertrophic salpingitis. The tube varies in size from that of the fifth to that of the index finger, has a violetish colour like dregs of wine, and has a fleshy consistency. If it be incised, it is seen to consist of a thick outer coat, either of hypertrophied muscular tissue or of newly-formed connective tissue, beneath which is a puply substance, of shining, silvery appearance formed of the vegetating mucous membrane with a much altered epithelium, and filling the interior of the obliterated canal of the tube, just as the medulla fills a long bone. In Kaltenbach's case there were great dilatation of the blood-vessels, and some small parietal extravasations. The abdominal extremity of the tube is obliterated, the uterine extremity simply constricted.

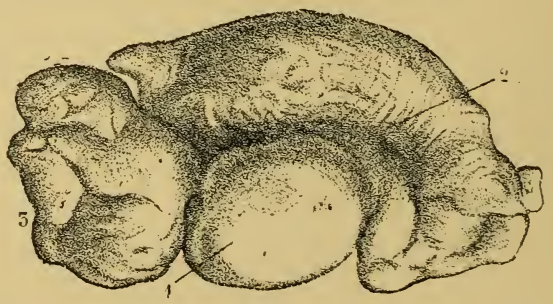

Fig. 320.—Hypertrophic pachy-salpingitis and fibrosis of the ovary.

1, small parovarian cyst in the broad ligament; 2, tube, greatly thickened; 3, ovary, of cirrhotic appearance, fused with the fimbriated extremity of the tube (from a case of laparotomy).

These facts seem to me dependent upon old purulent salpingitis, which has been saved from cystic dilatation by patency of the ostium uterinum. In my cases, and those of Kaltenbach and Schauta, there was a definite previous history of gonorrhœa.

These writers attribute, perhaps, too much importance to the muscular hypertrophy in the production of the tubal pains that we shall have to consider later on; they may be observed when the hypertrophy of the walls of the tubes is simply due to

* Kaltenbach. Ueber Stenose der Tube mit consecutiver Muskelhypertrophie der Wand. (Centr. f. Gyn., 1885, No. 43, p. 677.)—Schauta. Ueber Diagnose der Frühstadien chronischer Salpingitis (Arch. f. Gyn., 1888, vol. 33, part 1, p. 27 and foll.).—N. Sawinoff (Moscow). Ein Fall von Salpingitis chronica productiva vegetans (ibid., 1889, vol. 34, part 2, p. 239 and foll.).

Fig. 321.—Chronic hypertrophic salpingitis. Transverse section of the tube shown in fig. 320 (x 10).

1, thickened and fibrotic wall of the tube; 2, thickened and fused villosities; 3, pseudo-glandular formations; 4, blood-vessel; 5, accessory duct of the tube.

excess of connective tissue, and seem to be due to compression of the nervous filaments or a peri-neuritis, the existence of which has been clearly demonstrated by Sawinoff's preparations.

The second variety of chronic salpingitis may be qualified by the term atrophic. The cellular infiltration of the walls of the tubes, instead of giving rise to a constant increase in size, or to

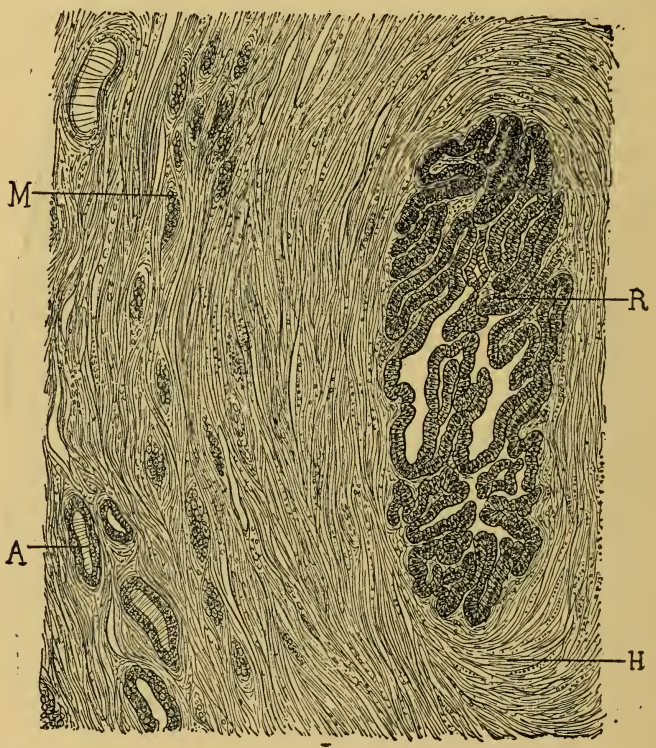

Fig. 322.—Chronic salpingitis, atrophic variety (Boldt).—Low power.

R, remains of the folds of the mucous membrane and the obliterated tubal duct; H, hypertrophied sub-mucous connective tissue and middle coat; M, scattered muscular bundles cut across; A, arterioles beneath the peritoneal covering.

a stable proliferation, as in the variety we have just considered, is re-absorbed and causes retraction of the tissues by a true cicatricial process. Probably we have here only a more advanced, or, so to speak, a secondary stage of hypertrophic pachy-salpingitis, which has now led to a contracting fibrosis of the tube. The muscular tissue disappears before the fibrous

tissue, the whole organ becomes contracted and finally becomes transformed into a firm and solid cord. These changes have been well studied and described by Boldt;* he has several times seen the lumen of the tube completely effaced by agglutination of the walls. The complete destruction of the epithelium which then occurs he compares with that which occurs in cirrhosis of the liver and kidney.

Orthmann, under the name of follicular salpingitis, distinguishes an anatomical lesion which does not deserve to be raised into a distinct variety. In it there are cystic cavities present which give the tube an areolated appearance. This pseudo-glandular formation, however, is common to all forms of inflammation of the Fallopian tubes (figs. 318 and 321).

In all the varieties of salpingitis that I have just described,

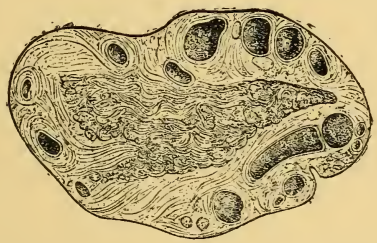

Fig. 323.—Fibro-cystic degeneration of the ovary.

the patency of the ostium uterinum permits of the evacuation of the mucus in proportion to its secretion, and hence the absence of ampullary or cystic dilatation.

II. *Lesions of the ovaries.*—The ovary which often escapes in catarrhal salpingitis is usually affected in cases of acute purulent and of chronic salpingitis. It is then generally misplaced and fixed by adhesions to Douglas' pouch or the walls of the pelvis. Suppuration may occur in it without there being any suppuration in the tube, but such an event is of extreme rarity. As a rule ovarian lesions come on later rather than before lesions of the tubes. Exceptionally they may be the only lesions, as I

* H. Q. Boldt. Amer. Journ. of Obst., Feb. 1888, p. 122.—Cf. especially fig. 3 (atrophy of the tube secondary to interstitial inflammation) which I reproduce above, and fig. 5 (transformation of the smooth muscular fibres into fibrous connective tissue).

have already said, and then we have fibro-cystic ovaritis (or oophoritis).

As a rule ovaritis has its starting-point in a localised peritonitis, a peri-oophoritis, and the change proceeds from without inwards. This peri-oophoritis, however, may be wanting, and the starting-point of the proliferation is then seated in the substance of the organ itself, around the vessels and the Graafian follicles.

In any case, the initial changes in acute ovaritis* are but little known; Paul Petit admits the existence of the following forms based upon well-observed cases :—

a. Cortical ovaritis.—This variety is secondary to peri-oophoritis. According to Cornil and Terrillon,† in a fair proportion of cases this, which is analogous to inflammation of the tunica vaginalis in the male (Bernutz), may be the sole lesion, the ovarian tissue remaining unaffected, and the disease then is limited to the formation of more or less resistant false membranes. But Lawson Tait does not share this opinion, and holds that when the serous covering of the ovary is affected the organ as a whole is notably increased in size, and changes are invariably found at some little distance from the capsule.

b. Diffuse ovaritis.—In diffuse ovaritis,‡ the ovary, increased in volume and œdematous, contains cystic follicles with serous or bloody contents. The stroma is everywhere the seat of a diffused embryonic infiltration, most pronounced, however, around the Graafian follicles and the vessels which are about to be obliterated.

c. Suppurating ovaritis.—Suppuration succeeds upon each of the preceding varieties when the changes do not end in the formation of fibrous tissue. It commences by the production of miliary abscesses in the very interior of the follicles.

Chronic ovaritis.—From a purely histological point of view, in accordance with Paul Petit we may distinguish a certain number of varieties of chronic ovaritis. Unfortunately they do not corre-

* K. Slavjansky. Die Entzündung der Eierstöcke (Arch. f. Gyn., 1872, vol. 3, p. 183).

† Cornil and Terrillon. Patholog. Anat. and Physiol. of salpingitis and ovaritis (Arch. de Physiol., Nov., 1887, p. 529 and foll.).

‡ Paul Petit. Ovaritis and cysts of the ovary (Nouv. Arch. d'obst. et de gyn., Nov. 1888, p. 807, case 3).

spond with very distinct clinical varieties, but it is none the less useful to be acquainted with them.

a. Cortical fibrosis.—The ovary is surrounded by false membranes, in the midst of which spots of extravasated blood, like those occurring in pachymeningitis, are sometimes to be seen. The fibrotic change invades the organ to a considerable depth, or limits itself, and that too in a very clear and regular manner, to a few millimetres beneath the capsule. The subjacent tissues are, however, none the less destined to disorganisation; the obstruction placed in the way of ovulation and the return of venous blood at the hilum causes dropsy of the follicles and hæmorrhagic extravasations, around which secondary foci of fibrotic change take place.

b. Chronic disseminated ovaritis.—This variety is characterised by the existence of patches of fibrosis starting around the vessels and the follicles, which come to the same things, since the Graafian follicles represent the most highly vascularised portions of the ovary. We have here probably a slow process, and one that is chronic from the very first. It is commonly seen with or without increase of blood-vessels in ovaries attached to large uterine fibromata.

c. Chronic hypertrophic ovaritis.—Fibrous hypertrophy of the ovary is characterised by increased production of the fibrous tissue with destruction of the follicles. In short, as Lawson Tait has very well said, it is only sclerosis in the second stage, before the contraction stage has come on. "I have had the opportunity," he says, "of following one of these cases for several years; at the present time it seems to be coming to the sclerotic condition." The hypertrophy is general or limited to the periphery.* In both cases the surface of the ovary, owing to accentuation of its normal furrows, calls vividly to mind the appearance of the cerebral convolutions.

Independently of fibrous hypertrophy, Lawson Tait and Slavjansky recognise the existence of a true hypertrophy arising from hyperplasia of the normal elements of the gland, and capable of increasing its weight up to 60—70 grammes (L. Tait).

d. Fatty degeneration.—In ovaries that have suppurated or undergone fibrous change small foci of fat are often met with.

* Darié and Bourges. Bull. Soc. anat., May 31, 1889.

In some cases, exceptional it is true, these foci may become of so great size as to convert the normal tissue of the ovary into a tissue like that of a fibro-lipoma.

e. Micro-cystic ovaritis.—This name, or that of chronic follicular oophoritis, has been given to a lesion characterised by the presence of numerous cavities varying in size from that of a millet-seed to that of a large pea, which are scattered over the surface of the ovary, and which have often been described in cases where castration has been performed simply for symptoms of pain (Battey's operation). These cavities are so small that they do not fairly bring the lesion under the head of cystic ovaritis; they contain clear, serous fluid, but sometimes clots of blood. Some writers see in this an undoubted pathological change.* Others, and they are in the majority, consider the condition to be in no wise morbid.† It is, in point of fact, extremely probable that these small dropsical follicles in themselves have no inflammatory signification, and they are met with in cases where their existence has not been revealed by any symptoms at all. But they may, however, come to be of some importance from their number by producing a definite vulnerability of the organ, and certainly interstitial fibrosis is very often witnessed in ovaries that are the subjects of this condition.‡

Be that as it may, there is no doubt that this denomination of sclero-cystic degeneration has often been used as a cloak to justify the removal of ovaries that ought never to have been interfered with. The term should be exclusively restricted to cases in which the cystic follicles are numerously scattered

* Hegar and Kaltenbach (*loc. cit.*) and L. Prochownick (Arch. f. Gyn., 1886, vol. 29, part 2, p. 183) only attribute a pathological significance to their presence if the stroma of the ovary shows inflammatory proliferation.

† Olshausen, *loc. cit.*—E. Zeigler. Lehrbuch der allg. und spec. path. Anatomie, 4th edit., 1886, p. 924.—Leopold. Arch. f. Gyn., 1883, vol. 21 (figs. 19, 23, and 24).—W. Nagel. Arch. f. Gyn., 1887, vol. 31, part 3, p. 327.

‡ In certain cases it seems that it is not dropsy of the follicle that occurs, but dropsy of the ovule. Then, according to Toupet, one can distinguish very clearly from the periphery to the centre of the cyst: the layer of cubical cells forming the wall; a narrow granular zone, composed probably of cellular detritus; a second peri-ovular epithelial layer; a more or less distinct hyaline membrane that would correspond to the vitelline membrane; a granular mass representing the yelk become dropsical, and showing in its centre a nucleus with nucleolus.—Paul Petit, *loc. cit.*—Note on the normal and pathol. evolution of the Graafian follicle (Bull. et Mém. Soc. obstet. et gyn., Paris, July 11, 1889).

through the whole thickness of the organ and transform it into a piece of simple areolar tissue.*

f. Complete fibrosis.—It may happen that the whole organ is invaded by an interstitial inflammation which leads to concomitant hypertrophy. At first this is not incompatible with ovulation, but if it exceeds certain limits the follicles become compressed and choked up (Slavjansky). Compression of nervous filaments,† brought about in the same way when the ovary is the subject of atrophying fibrosis, has been regarded as the chief cause of the nervous symptoms for which Battey's operation has been performed.‡ Generally, the immediate antecedent of fibrosis seems to be a localised peritonitis or peri-oophoritis, and the change proceeds from without inwards. This peri-oophoritis, however, may be absent (Nagel), and then the starting-point of the proliferation is the interstitial tissue of the ovary itself. It is in these cases that the hypertrophied ovary may be seen to have reached the size of a goose's egg, and to have a tuberculated, muriform, hob-nailed surface (fig. 320). But generally the condition is the opposite, and the ovary is shrunken and diminished in size in consequence of the contraction of the newly-formed fibrous tissue.

Mary A. Dixon Jones § found in such an ovary, the size of an egg and granular on the surface, which had become prolapsed and had been removed by castration, an interesting lesion that I have already mentioned among the lesions of chronic metritis, viz., lymphangiectasis. The lacunæ were filled with nearly homogeneous lymph and a few lymphatic corpuscles; in it could clearly be distinguished an elastic coat and a thick endothelium.

Fibrosis of the ovary usually coincides with micro-cystic degeneration, and thus a mixed condition occurs, fibro-cystic ovaritis,‖ which is much more frequently seen than either of the two individually.

* Conzette. Micro-cystic ovaries. Thesis, Paris, 1890.

† A figure demonstrating this condition has been given by Mary A. Dixon Jones. Amer. Journ. of Obst., Feb. 1888, vol. 21, p. 164.

‡ Palmer Dudley. New York Med. Journ., Aug. 11 and 18, 1888, vol. 48, pp. 147 and 174.

§ Mary A. Dixon Jones, *loc. cit.*, p. 158. (Cf. fig. 1, drawn after a preparation by C. Heitzmann.)—The authoress compares hypertrophy of the ovary, the result of lymphangiectasis, to macroglossia due to the same cause.

‖ The stroma, normally formed of connective tissue cells with multiple processes, which, from being pressed one against another, give the fusiform appearance becomes

Suppuration in the ovary generally co-exists with suppuration in the tube. Both of them become fused, so to speak, and sometimes form only one abscess-cavity; pyo-salpinx then accurately should be denominated pyo-oophoro-salpinx. Suppurative ovaritis will also be described at the same time as this latter lesion.

Symptoms.—It is rare to see acute oophoro-salpingitis without the existence of a similar inflammation of the uterus. It is therefore difficult to clearly define how much depends upon either of the two conditions. The general symptoms accompanying uterine disease, upon which I have already dilated at such length, here also take the first rank amongst the symptoms. I shall, however, point out the special points which allow of our diagnosing inflammation of the tubes and of the ovaries.

The pain has the character of pseudo-neuralgic crises which have their seat in the ovarian region itself, or in the lumbar region. The pain shoots upwards towards the epigastrium, downwards into the thighs; occasionally, but not in all cases, true pains, that have been called "tubal," occur, and their cessation may be marked by the evacuation of a certain quantity of muco-pus, coming, whatever may be said to the contrary, less from the tubes than from the cavity of the uterus, reflex contraction of which has been induced by the attacks of pain.

Pressure over the region of the appendages is painful, whether it be applied through the abdominal or the vaginal wall. If the inflamed ovary be pressed between the two hands, exquisite pain is produced (Gallard),* and this particularly on the left

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gradually changed into fibrous tissue, made up of dense and wavy bundles, poor in cells and blood-vessels, on account of the plastic obliteration of a large number of arteries and veins. The bundles of connective tissue are thicker around the vessels, the follicles, and the corpora lutea, which appear for the most part in the shape of *débris*, are sometimes very numerous, and are recognisable by their plicate arrangement and their hyaline appearance. This multiplication of the corpora lutea evidently arises from a kind of morbid maturation of follicles in the course of the acute phases of the disease. In the newly-formed tissue may also be seen, when the fibrosis is advanced, elongated, oval, or stellate clefts, remnants of blood and lymphatic vessels, and of Graafian follicles. The latter, moreover, are fewer in number, and sometimes completely wanting, according to the extent of the disease. Some of them have undergone changes that end in the formation of serous or blood microcysts (P. Petit).

* Dalché. On ovaritis. Thesis, Paris, 1885. Concerning the symptoms, cf. further A. Ferrand in the Dict. encycl. des sciences méd., Art. Ovaritis, Paris, 1882, vol. 18, p. 760 and foll.—O. Terrillon. Salpingitis and ovaritis. Paris, 1891, p. 33 and foll.—Ozenne. Salpingitis (Arch. gén. de méd., May-June, 1890).

side, for the left ovary is more frequently affected. In the same way it is known that in the male the left testicle is the more vulnerable (varicocele, epididymitis, &c.). The greater frequency of lacerations of the cervix on the left side, and the more direct extension of the inflammation which occurs on this side, either by ascending endometritis or by lymphangitis, may also go some way towards explaining the fact.

The pain in the flanks and loins is often accompanied by pain in the stomach and vomiting; it appears most frequently at the time of the menstrual nixus. Exceptionally the catamenial periods occur when pain is absent, and the attacks occur during the intervals (inter-menstrual dysmenorrhœa).

Metrorrhagia is an almost constant symptom, but there are often prolonged periods of amenorrhœa, and hence menstruation is very irregular.

Examination of the inflamed organs in acute tubo-ovaritis is very difficult on account of the pain it induces; if there be any doubt, and if speedy intervention has to be decided upon, the patient must be anæsthetised. I cannot sufficiently strongly oppose the systematic neglect of this invaluable means of assistance in the investigation, and the substitution for it of a single diagnostic element, viz., localised pain.* In this way the number of exploratory laparotomies is bound to be unjustifiably multiplied.

Palpation of the appendages can be performed by following Schultze's† excellent directions. For examining the right side the first and second fingers of the right hand are introduced into the vagina and the left hand is placed on the abdomen, for the left ovary the opposite course is taken. The patient is in the supine position, the knees raised and the thighs rotated outwards; the psoas muscles are thereby put on the stretch. The internal border of these muscles must be followed as a landmark up to the brim of the pelvis, and then the examination must be continued slightly more inwards towards the horns of the uterus. Here one meets with a small ovoid mass, normally the size of an almond, that can be seized between the two hands. Any disease of the appendages can scarcely escape recognition if

* L. Championnière. Bull. et Mém. Soc. de chir., Dec., 1888, p. 927.

† B. S. Schultze. Zur Kenntniss von der Lage der Eingeweide im weiblichen Becken (Arch. f. Gyn., 1876, vol. 9, p. 262).

an examination be thoroughly made according to these rules, the patient being at the same time anæsthetised.

Nöggerath* has proposed to examine the tubes by vesico-rectal touch, and he has thereby gained further information which it would evidently be impossible to obtain otherwise; but this method, which is not entirely devoid of disadvantages, would not be employed except as a last resource. Although Hegar asserts that he can recognise by touch microcystic degeneration of the ovary and catarrhal salpingitis, it must be confessed that such delicacy of touch could never become the stock-in-trade but of an excessively small number of practitioners. Nevertheless, in acute salpingitis the surgeon will often recognise lesions much more easily than would be expected from their limited extent, because there is added thereto a peripheral œdema which doubles or trebles the size of the inflamed tube. In chronic salpingitis the tube will be felt as a resistant cord fixed by adhesions to the sides of the pelvis. When, with these physical signs and undoubted antecedent metritis, a fixed pain localised over the appendages, presenting the characters that I have pointed out, and accompanied from time to time with acute attacks of peri-salpingitis as it will later on be described, is complained of, salpingitis may be diagnosed with certainty; and suppuration will be suspected if the symptoms are very acute, and if the starting-point is a gonorrhœa recently contracted or lighted up afresh by some septic infection after abortion.

Diagnosis.—The pain of salpingitis must not be confounded with that of ovarian neuralgia, ovarialgia, or painful ovary, which is simply a symptom of hysteria. The latter has its seat generally on the left, but may be bilateral. Charcot has shown that it is often accompanied by anæsthesia of the same side and hystero-epileptic attacks. This pain manifests itself spontaneously during the attacks of major or minor hysteria; pressure calls it forth, and as it is frequently associated with dysmenorrhœa of nervous origin, one may be tempted to attribute this symptom to an ovarian inflammation.†

* Nöggerath. The vesico-vaginal and recto-vaginal touch. (Amer. Journ. of Obst., 1875, vol. 8, p. 123.)

† According to Charcot, it is rather in the ovary and not only in the ovarian region that the pain has its seat. Having under observation a pregnancy in a hystero-epileptic woman, the subject of pronounced ovarian pain, he was able to follow the rising of the painful zone with the rising of the ovary higher into the abdomen by the

The manner in which the patient acts under the pain induced by pressure is itself characteristic; in cases of inflamed appendages the woman cries out, and instinctively moves herself so as to escape from the hand of the surgeon; in cases of painful ovary the movements are in no wise co-ordinated, and are simply irregular convulsions.

Lumbo-abdominal neuralgia which may exist alone, and which so frequently accompanies metritis, is distinguished by having its seat especially in the abdominal wall, and by being brought out particularly by superficial pressure, over the well-known points of emergence of nervous filaments. Pressure of the appendages by bimanual palpation may then appear painful, because the abdominal wall is at the same time compressed; it is easy to make certain on this point by repeating successively the two methods of examination.

Inflammation of the uterus will be recognised by its special symptoms, to which I have no need to return. It is rare for it to be entirely absent in patients who have characteristic tubal inflammation; I have already said that the two affections were but rarely separate. Even when it is the predominant condition, metritis is very frequently accompanied by a slight amount of ascending salpingitis, which may be too slight to give rise to physical signs appreciable to touch, to deserve sharing in the denomination of the affection or to modify the treatment, but quite sufficient to lead to tenderness of the appendages.

Is it possible to determine in oophoro-salpingitis, from the physical examination and apart from the history, the respective degrees of implication of the ovary and tube? The diagnosis, it

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development of the uterus. The characters of this pain are somewhat special, and a knowledge of them would prevent misconstruction of their nature. Progressive pressure leads to the appearance of a hysterical attack more or less marked, and commencing by constriction at the epigastrium, nausea, palpitation, acceleration of the pulse, and globus hystericus; then follow singing in the ears, sharp pain in the temples, obscuration of sight, all of which phenomena are especially marked on the side affected with ovarian pain; at the end there may be more or less loss of consciousness. On the other hand, energetic pressure over the ovarian region may arrest the attack. Occasionally one is obliged to exert all one's strength to overcome the rigidity of the abdominal muscles. After this collection of clinical peculiarities, it is difficult to overlook the purely neuralgic character of such a pain; and the diagnosis will be further confirmed by the presence of other neuralgiæ, of paralyses, of contractures, or of hystero-epileptic fits. Further, the special marks of hysteria may be found, viz., hysterogenetic zones (sub-mammary, dorsal, points), anæsthetic regions, retraction of the visual fields, &c.

must be confessed, is generally impossible, but happily it is not necessary from the operation point of view. Fibro-cystic degeneration of the ovary may no doubt exist without there being any noteworthy tubal lesion, but nevertheless lesions of the two portions are rarely dissociated. The ovary is very frequently more or less closely united to the tube by adhesions, so much so that the tumour felt is of mixed nature, tubo-ovarian. There are cases, however, in which by bimanual examination a thickened cord forming the tube can be differentiated from the oblong tumour formed by the ovary. The latter is incomparably more mobile and more detached from the edge of the uterus; it is often necessary to examine for a very long time and to introduce the middle and ring fingers deeply into the posterior and lateral culs-de-sac of the vagina before it is found; in some cases bimanual palpation combined with rectal touch might be found more advantageous. Beside the peculiarities of shape and mobility, the ovary presents when inflamed an excessive tenderness, which causes the patient to cry out and to shrink back even when it has simply been rolled beneath the examining finger. Finally, it is when the ovaritis predominates, especially when it is present on both sides, that the metrorrhagia or the dysmenorrhœa are most intense, and that sudden increase in size of the tumour at the menstrual periods occurs, whether that increase be due to simple congestion or possibly to extravasation of blood into the microcystic cavities.*

Cystic salpingitis and peri-salpingitis may be recognised by the size, the characters, and the connections of the tumour, which are much greater.

Nevertheless it may be well to remark that after an interval of a very few days the practitioner may meet with, by turns and on different occasions, either the elongated and funnel-shaped tumour of acute or chronic salpingitis or the rounded and more or less diffuse swelling of peri-salpingitis provoked by an acute exacerbation of short duration.

Course and Prognosis.—Inflammation of the mucous membrane of the tubes is infinitely more obstinate than that of the uterus. When the septic element is locked up in the multiple folds of the external third of the tube, it cannot be reached by direct

* Eug. Boeckel. Gaz. méd. de Strasbourg, 1861, p. 79.—F. Rollin. On hæmorrhages in the ovary (Ann. de Gyn., Nov. 1889, vol. 22, p. 354).

therapeutic agents, and if the patient recovers, one may fairly say it is of herself, and by destruction of the micro-organisms *in situ*. Of course this happy natural result is not impossible in other regions, and it may therefore occur here also, especially if attentive treatment be directed to the uterine mucous membrane, upon which that of the tubes depends anatomically and physiologically, and thereby siege be laid, so to speak, against the tubal inflammation, and the anatomical elements of the tissues be constantly fortified in their struggle against the micro-organisms.

Can complete recovery take place with *restitutio ad integrum?* Certainly it can, but it must be extremely rare. The tube that has recovered from an acute inflammation as a rule remains very greatly changed. Cases like those observed by Boldt show also the possibility of recovery with atrophy; on the other hand, in practice the persistency of morbid symptoms, when once the appendages have been affected, prove how rebellious the disease is, and how liable it is to leave traces behind.

What causes the peculiar seriousness of acute or chronic salpingitis is the imminent risk of sudden attacks of peri-salpingitis (pelvic peritonitis). A slight fatigue or an error in diet is quite sufficient for the symptoms to undergo an exacerbation, and for the condition of the patient to become suddenly more serious. Lawson Tait thinks that in such cases a few drops of muco-pus have fallen into the peritoneum, and have irritated it. Whether this rough-and-ready theory be true or not, by touch one finds a peripheral thickening caused by infiltration or acute œdema of the sub-peritoneal cellular tissue. Generally, this condition resolves with rest and suitable treatment until another relapse occurs. These constant relapses may last over months or even years, and are on each occasion remarkable by the suddenness of the appearance and disappearance of the inflammatory tumours that may be felt in the culs-de-sac. These tumours, formed of small circumscribed nodules, suggest the sensation of masses of glands to the finger, and have in consequence been attributed by many writers to inflamed glands without any further consideration, and hence the names of peri-uterine "adenitis" or "adeno-lymphitis" that have been given to the affection.* But there are no glands whatever in this

* Guéneau de Mussy. Clin. méd., vol. 1, p. 474.—Martineau. Clinical lectures on dis. of the uterus, p. 779.—Courty. Ann. de gyn., 1881, vol. 15, p. 241.—Carreau. Med.

locality, and hence no adenitis; but no doubt this acute œdema takes place around lymphatic vessels, and therefore constitutes peri-lymphangitis. It is to be noticed exactly above the vaginal cul-de-sac on the sides of the cervix at a point where Poirier has described a twisting of the lymphatic vessels that pass from the cervix into the iliac glands.

Sterility does not seem infallibly to result from salpingitis; it may be recovered from without obliteration of the tube. However, when a tubal inflammation of long standing has obliterated both tubes, fecundation is impossible, and this, no doubt, is the reason of the frequency of sterility amongst prostitutes.

Treatment.—It is not sufficient, whatever certain operators have said to the contrary, that a woman has persistent pain in the region of the appendages, to warrant the performance of laparotomy, even though it were restricted to an exploratory incision. After a period of really surgical excesses, particularly abroad, where, to use Emmet's words,* "removal of the appendages was performed with light heart by competent and incompetent persons," we have come to the conclusion not to sacrifice the fertility of women so easily, but to endeavour to cure the disease rather than to cut it out.†

The treatment of catarrhal tubo-ovaritis is mixed up with that of the metritis, in the same way as the treatment of ascending pyelo-nephritis coincides with that of the cystitis of which it is the consequence. Absolute rest, gentle purgatives, thorough antisepsis of the vagina, warm and prolonged vaginal irrigations, such are the first remedies to be recommended. To them, if necessary, may be added local abstraction of blood, either by scarification of the cervix or by leeches placed in the iliac fossæ; this is an excellent remedy for the acute pain, when there are no contra-indications. Applications of small successive blisters with hydrochlorate of morphia (1 cgr.) on the denuded surface, repeated use of the actual cautery in the iliac region, prolonged

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Record, July 2, 1881, vol. 20, p. 5.—Emile Tillot. On small nodules of chronic peri-uterine adenitis and their thermal treatment, 1885.—A. Martin. Path. u. Ther. der Frauenkr., 1887, p. 404.

* Emmet. Baltimore Congress, Sept., 1886 (Centr. f. Gyn., 1887, No. 23, p. 370).

† Coe. Is disease of the uterine appendages as frequent as it has been represented to be? (Amer. Journ. of Obst., June, 1886, p. 561).—Sarah Post, W. Polk. New York Med Journ., Sept. 24, 1887, and Amer. Journ. of Obst., 1887, vol. 20, p. 631.—P. Mundé. Amer. Journ. of Obstet., 1888, vol. 21, p. 150.

warm baths, laudanum, valerian, or chloral enemata are the best means of alleviating the pain.

As I have said above, we may hope to cure the salpingitis at the same time as the endometritis, if the disease has not existed a sufficient length of time to have obtained a firm hold upon the mucous membrane. Uterine curettage, followed by repeated injections of tincture of iodine, according to the principle described at length in the chapter on metritis, has more than once in my hands sufficed to cure, most indubitably, salpingitis at its commencement.* Trélat † has had similar successes from curettage, followed by injections of creosoted glycerine. And simply, it is to the antiseptic treatment of the metritis much rather than to a problematic mechanical action, with its very indirect dilatation of the ostium uterinum, that must be attributed the recoveries published by Walton, Gottschalk, and Doléris.‡

Should curettage be performed when the salpingitis is accompanied by acute peri-salpingitis, characterised by painful masses in the vaginal culs-de-sac ? In my opinion it should not ; it is, I think, far better to wait until the consolidation has disappeared under the influence of antiphlogistic treatment and rest, and this result occurs very quickly unless the case be one of encysted tumour of the tube. And, in addition, this delay allows of the confirmation or otherwise of an important diagnosis. For, to

* Alex. Rizkallah. Critical study of the treatment of salpingitis, and in particular the value of curettage of the uterus in catarrhal salpingitis. Thesis, Paris, 1889.—M. Cuellar. Curettage of the uterus in peri-uterine affections. Thesis, Paris, 1891.

† U. Trelat. Bull. et Mém. Soc. de chir., Dec. 26, 1888, p. 1035 and foll.—Hélène Finkelstein. The influence of curettage of the uterus upon the complications of endometritis. Thesis, Paris, 1889.—The indirect treatment of the tubal complications of endometritis seems to have been first described by Walton, Royal Acad. of Belgium, July 30 and Dec. 30, 1887, and Jan. 28, 1888.—Drainage of the uterine cavity in cases of pelvic abscess, Ghent, 1888.—Poullet, of Lyons (Lyon méd., Feb. and March, 1888) has, in his turn, come to similar conclusions, but carries them, to my mind, too far.

‡ Doléris. Artificial evacuation of encysted collections of fluid in the tube by permanent dilatation and uterine drainage (Comptes rendus Soc. de biol., Dec. 21, 1888). The diagnosis of encysted collection of fluid in the cases cited seems to me more than doubtful ; they were no doubt cases of those foci of acute peripheral œdema that often complicate salpingitis, and give rise to the sensation of a tumour. Doléris himself seems to have recognised this fact later, and he admits it with frankness : "I am not sure," he says, "that in some of the cases in which I have seen dilatation of the uterus and curettage cause apparent tumours to vanish in some kind of way, I was not face to face with secondary peritonitic collections of fluid in the pelvis." (Some points in the differential diagnosis of oophoro-salpingitis in Nouv. Arch. d'obst. et de gyn., August, 1889, p. 355.)

recommend forcible dilatation and curettage as the curative treatment of peri-metritic exudation products, is to formulate a very dangerous precept, inasmuch as it assumes the impossibility of an error in diagnosis. Certainly the treatment of metritis by curettage has in some cases cured or improved serous peri-salpingitis along with the salpingitis. But this treatment may under similar circumstances kill a patient who is the subject of unrecognised pyo-salpinx, by leading to rupture of the cyst. In face of this terrible danger, and remembering the very frequent uncertainty in diagnosis, is it not better to wait before curetting the uterus until the exacerbation, the intensity of which one can never gauge, has disappeared, and until one is certain that it does not mask a collection of pus ?

While dealing with the indirect treatment, mention may be made of the therapeutic value of electricity in certain forms of salpingitis.* I think its value has been very considerably exaggerated. It seems to me certain that encysted collections of material in the tubes can only be acted upon by puncture, and that is quite as dangerous with the "fluidifying" point of an electrode as with the point of a trocar. If the case be one of hydro- or hæmato-salpinx, not only does one run the risk of giving rise by this incomplete opening to an interminable fistula, but also to septicæmia. Vaginal galvano-puncture has, moreover, the disadvantage of leading to the formation of adhesions if it does not succeed in giving an exit to the contents of the tube, and these adhesions are themselves a cause of pain and render all attempts at later operation more difficult. With these reservations, I have no difficulty in acknowledging that galvano-cauterisation of the uterine cavity, by improving the condition of the endometritis, may at the same time bring about the recovery of a catarrhal salpingitis ; only I believe that this method is more complicated and less certain than curettage and intra-uterine injection.

In very nervous women, long continued use of the interrupted current acting upon the uterus by means of bi-polar electrodes, has produced occasional relief. But one must always proceed with great care, and be always on the look-out for the hidden presence of pus, for electrical treatment of the cavity of the

* Apostoli. Bull. de thérap., Sept. 30, 1888.—Union méd., 1889, pp. 330, 338, and 358.

uterus has been known to lead to the rupture of a pyo-salpinx.*

Massage has been highly recommended of late years for all inflammations of the uterus and the appendages,† and like all new methods, it has roused extreme enthusiasm.‡ But this treatment is far from being harmless. I believe that it ought to be absolutely restricted to cases of chronic salpingitis, in which there is not the slightest suspicion of an encysted collection of fluid, for this might be accidentally ruptured into the peritoneal cavity, instead of being emptied through the ostium uterinum, according to the wishes of the masseur.

In cases of acute inflammation massage is more harmful than advantageous. By rubbing the friable and engorged tissues ruptures and very dangerous hæmorrhages § may be brought about. However, I should advise the use of massage for cases where there are the remains of old inflammation that has long ago become quiescent, bands, adhesions, cicatricial alterations in position, which keep up pain, for which recourse has too frequently been had to laparotomy at the outset.

In a word, massage ought to follow in gynæcology similar rules to those which have been laid down for it in general surgery in the treatment of joint affections, for example. If all therapeutic means have failed after they have been tried for a sufficient length of time one is justified in having recourse to the radical operation of oophoro-salpingotomy. There must be no hesitation in performing it without delay when the intensity

* Kehrer. Heidelberg meeting of scientists and medical men, Sept., 1889 (Centr. f. Gyn., 1889, No. 42, p. 736).

† Seiffart. Die Massage in der Gynäk., Stuttgart, 1888.—Alf. Resch. Thure Brandt's heilgymnastische Behandlung weibl. Unterleibskrankheiten, 1888.—A. Semiännikow. St. Petersburg obst. and gyn. Soc., Sept. 22, 1888 (Centr. f. Gyn., 1889, No. 5, p. 81).

‡ Weissenberg (Centr. f. Gyn., 1889, No. 22, p. 380) proposes that surgeons who have not sufficiently long or pliant fingers to perform massage conveniently, should use a piece of wood covered with india-rubber instead of the fingers introduced into the vagina, as a *point d'appui* for the external manipulations.

§ H. Koplik (Amer. Journ. of Obst., Feb., 1889, p. 136) has mentioned the dangers of hæmorrhage, of rupture of pyo-salpinx, or of follicular cysts by massage; he reports a case of hæmatoma thus produced at a single sitting.—Dührssen (Berl. gyn. and obst. Soc., May 10, 1889, in Centr. f. Gyn., 1889, No. 24, p. 417) cites the case of a woman who had been operated upon by Gusserow for a suppurating ovarian tumour with peritonitis. The tube was found full of blood, and this, as well as the peritonitis, was attributed to the massage that the woman had a short time previously undergone. The patient succumbed.

of the symptoms causes the suspicion of a purulent salpingitis that may very rapidly become threatening to life. Nor must it be put entirely out of the question, although it must be subjected to greater reserve in cases of chronic non-purulent tubo-ovaritis. For these lesions, though they do not threaten life, nevertheless render it quite unbearable by reason of the well-nigh incessant pain to which they give rise, and of the effect they produce upon the general health. But it is only after at least six months' patient treatment by the methods I have indicated that one would be justified in proposing and performing castration for non-purulent salpingitis.

Removal of the appendages, save in exceptional cases, is a harmless operation. It comprises really two distinct operations, viz., 1. Rupture of peripheral adhesions and reposition of the uterus, which is generally either retroverted or retroflexed; and 2. Removal of the tube and ovary as near as possible to the uterus.

The abdominal incision should be the rule. The vaginal incision, recommended principally by Gaillard Thomas and Byford in America, by Gottschalk* in Germany, and which Picqué † has endeavoured to introduce into France, though good in some special cases, does not here seem to me to offer any real advantages, and presents serious inconveniences when the smallest complication arises in the operation. The ovary on the side from which the tube is removed must always be removed itself, even when it appears to be quite healthy.

Would it not be possible in certain cases to limit oneself to the first portion of the operation, viz., rupture of adhesions, liberation and reposition of the uterus and its appendages? B. E. Hedra‡ was the first to take up the view that the morbid symptoms for which healthy ovaries have often been removed, and notably the severe abdominal pain might be modified by destruction of the adhesions alone, often simply

* Gottschalk (Obstet. and Gyn. Soc. of Berlin, Feb. 13, 1891, in Centr. f. Gyn., 1891, No. 13, p. 26) declares himself in favour of the vaginal incision for suppurating ovaritis whenever the seat of the tumour allows of its being adopted.

† Bonnecaze. Value of indications for the vaginal incision applied to the removal of certain small tumours of the ovary and tube.

‡ B. E. Hadra, of Austin, Texas (Journ. Amer. Med. Assoc., June 20, 1885), has reproduced the principal points of his communication to establish his priority over Polk in a more recent article, "Remarks on intra-peritoneal adhesions" (Amer. Journ. of Obstet., Sept., 1887, p. 957).

filamentous, that bind together the various abdominal viscera. He has therefore proposed that each time laparotomy is performed under these conditions all the abdominal organs should be carefully examined for adhesions, and the hand gently passed between the coils of intestine beneath the omentum and above it; he contents himself with these manœuvres if the appendages are healthy, and only removes them if they are undoubtedly diseased.

Polk* has gone still further; having seen a patient recover after an operation in which he only removed one tube after having followed out the above mentioned procedure, although the tube left behind presented manifest signs of inflammation, he has proposed simply to express the muco-purulent contents of the diseased tubes, to wash out the peritoneum, and to close the abdomen after if necessary, performing a radical operation to prevent the retroflexion from re-occurring.

Mundé† has theoretically supported this view, and he has added to expression of the tubes the idea of catheterising and washing them out from the abdominal end with a warm solution of 1 in 5,000 sublimate.

F. Howitz‡ has also occasionally substituted breaking down of adhesions for castration. He relates a remarkable case in which symptoms of chronic salpingitis were thus recovered from without salpingotomy, although the right tube was inflamed and swollen. He lays great stress on the pathological part played by adhesion of the great omentum to the symphysis pubis.

This relatively conservative tendency is now gaining ground with many operators. Lucas-Championnière§ clearly pronounced himself in its favour at the Surgical Society of Paris. Terrillon‖ on one occasion put the principle into practice. Polk,¶ out of 31 cases of laparotomy for disease of the appendages, contented himself with breaking down the adhesions in 24 of them.

* W. M. Polk. Amer. Journ. of Obst., June, 1887, vol. 20, p. 30.

† Mundé. Ibid., Feb., 1888, vol. 21, p. 150.

‡ F. Howitz (Copenhagen). Hosp. Tidende, 1889, vol. 7, No. 27, p. 777, and No. 28, p. 806. (Analysed in Centr. f. Gyn., 1889, No. 31, p. 549).

§ J. L. Championnière. Bull. et Mém. Soc. de chir., Dec. 5, 1888, p. 927.

‖ O. Terrillon. Annal. de Gyn., 1889, vol. 31, p. 348.

¶ Polk. Certain operations designed to preserve the uterine appendages. (Amer. Journ. of Obst., 1891, vol. 24, p. 1043).

Martin* has not confined himself to breaking down adhesions; he opens up the obliterated extremity of the tube, and has even reconstructed an opening by performing salpingostomy. I shall return to this point in the following chapter.

It is impossible to pronounce an opinion on these procedures, for they are still of too recent date. Perhaps it is to be feared that surgeons will fall into the opposite extreme, and after having been much too ready in removing, may substitute for extirpation ingenious operations having only an illusory or temporary effect. However, the happy results of simple hysterorraphy after breaking down of adhesions in cases where salpingitis and peri-salpingitis manifestly existed, show that many tubes and ovaries have certainly been sacrificed that might have been preserved. Reposition of the uterus, liberation of the appendages, and antiseptic washing-out of the pelvis, which are the necessary consequence of such an operation, are surely destined to diminish the number of oophoro-salpingotomies.

No doubt extirpation of the appendages might be reserved for three classes of cases: 1. Ovaritis and salpingitis where one has cause to fear the presence and consequences of pus; 2. Painful fibro-cystic ovaritis; 3. Chronic parenchymatous and cystic (serous and hæmatic) salpingitis in which, in spite of the unthreatening course of the diseases, one is obliged to operate for the relief of menorrhagic, dysmenorrhœic, or reflex nervous troubles.

Removal of inflamed appendages which only contain a small quantity of mucus or muco-pus, and are not transformed into purulent cavities or pyo-salpinx is, one may say, a benign operation. Consideration is not so much called for by the severity of the interference as by the sterility to which it necessarily leads.

At the end of the following chapter I shall give the latest statistical results, though unfortunately the surgeons have not sufficiently divided up the cases of salpingitis into distinct categories.

* A. Martin. Ueber partielle Ovarien- und Tubenexstirpation (Volkmann's Samml. klin. Vorträge, 1889, No. 343).—W. A. Freund (ibid., 1888, No. 323) has proposed the following of a similar course.

CHAPTER II.

CYSTIC OOPHORO-SALPINGITIS.

Pathological anatomy.—I. Cystic salpingitis: pyo-salpinx; hydro-salpinx; hæmato-salpinx and apoplexy of the tube.—II. Cystic ovaritis: serous cysts; blood cysts; purulent cysts; lymphatic cysts.—Symptoms. Profluent salpingitis.—Differential diagnosis of hydro-, hæmato-, and pyo-salpinx. Diagnosis from: intra-ligamentous cyst; tubal pregnancy; pelvic adenitis; pregnancy; adherent enterocele.—Progress. Duration. Termination. Prognosis. Relapses. Rupture. Fistulæ. Extension. Sequelæ.—Treatment. Oophoro-salpingotomy. Method of performance. Trendelenberg's inclined position. Evisceration. Partial resection of the tube. Salpingostomy. Partial resection of the ovary. Salpingorrhaphy. Immediate results of operation. Mortality. Utero-ovarian castration.

Pathological anatomy.—I. *Cystic salpingitis.*—Amongst cystic dilatations of the Fallopian tubes in the first rank must be placed that which is due to an accumulation of pus. For it seems certain that pyo-salpinx often becomes transformed into hydro-salpinx, and occasionally into hæmato-salpinx. When the inflammatory process becomes arrested, no doubt by spontaneous destruction of the micro-organisms, the abscess in the tube, just like a cold abscess, may become changed into a serous collection by a kind of clarification of the pus, the solid elements of which are deposited upon the wall and the liquid elements increase in quantity. And this seems to be the origin of a large majority of cases of hydro-salpinx. Lastly, rupture of the newly-formed vessels in the walls of the sac of an old pyo-salpinx has sometimes filled it with blood.

Pyo-salpinx or purulent cyst of the tube is a result of purulent salpingitis, and particularly of that form dependent upon gonorrhœal or puerperal infection, the latter occurring principally after abortion. Lawson Tait,* and later Freund,† have attached much importance, as I have already said, to incomplete development, or an infantile condition of the oviduct which would predispose it towards obliteration and cystic transformation.

* Lawson Tait. Treatise on dis. of the ovaries, French trans., Paris, 1886. p. 78.—B. M. J., 1887, vol. 1, p. 825.

† W. A. Freund, *loc. cit.*

The tube, the outer extremity of which is closed by agglutination and a kind of intussusception of the fimbriæ, is dilated in its external two-thirds, more rarely throughout nearly its whole length; there generally remain from 1 to 2 cm. of the uterine end, which preserves nearly its normal size, though it is firmer than usual. The fimbriated extremity is sometimes adherent to the ovary, which then becomes more or less intimately fused with

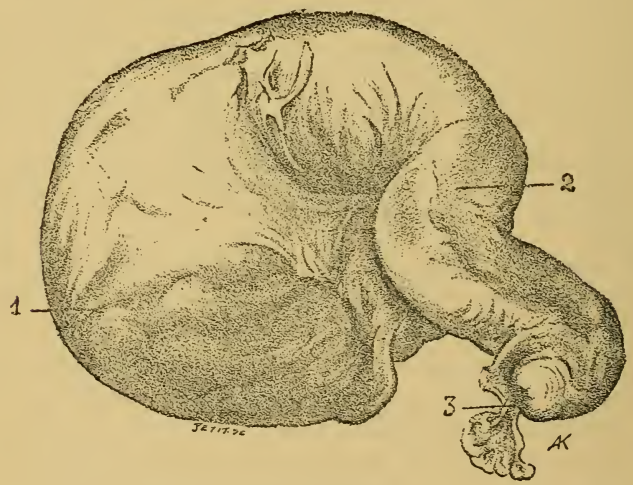

Fig. 324.—Pyo-salpinx.

1, dilated portion of the tube formed by its obliterated abdominal extremity, no trace of the opening is now seen; 2, middle portion thickened and curved on itself; 3, section of the tube near the uterine extremity; below is seen the remains of an adhesion.

the cyst; it is very rare to find this extremity intact and free, stretching beyond the obliterated purulent sac, which is within it and nearer to the uterus. Broad adhesions are scattered around the tube and ovary and fix it generally behind in Douglas' pouch. The uterus itself is in consequence ordinarily displaced. The left tube is almost invariably more affected, and earlier affected than the right.

The dimensions of cysts are very variable; they have been reported as large as the head of a fœtus* or a cocoa-nut.† But

* Dagron. Bull. Sec. anat., 1888, p. 26 (with fig.); operation by Championnière. The tumour was of the shape of a bagpipe or a stomach, and contained approximately 1,200 grammes of pus. It is also figured in the Bull. et Mém. de la Soc. de chir., Jan. 18, 1888, p. 66.

† J. W. Elliott. Boston Med. and surg. Journ., April. 21, 1887, vol. 116, p. 378.

ordinarily they do not exceed the size of a small pear, which they further resemble in shape; they are often a little curved back upon themselves like a huntsman's horn (fig. 324). They are yellowish-white in colour. The thickness of the wall of the sac varies, there is often a weak spot that corresponds with the adhesions of the sac behind; and there is also much difficulty in not rupturing it at this spot when shelling it out. The internal surface is rugose; the pus is generally creamy and yellowish, and when the adhesions with the rectum are close, it has a fœtid smell.

A parovarian or ovarian cyst situated beneath the inflamed

Fig. 325.—Pyo-salpinx.
Seen under a low power (Wyder).

Fallopian tube may itself suppurate and communicate with the tube.* I have met with an example of the first variety.

Under the microscope the internal surface is found to be covered with ramifying vegetations similar to those of acute catarrhal salpingitis, but twice or three times as thick, owing to an infinitely more abundant infiltration of their stroma by embryonic cells. They are covered by a single layer of cylindrical cells which persists in the clefts between them. The deep layers of the mucous coat are rich in fusiform cells. Nearer the surface there is a zone of cellular infiltration, so abundant as

* J. W. Elliott. A case of chronic salpingitis; tubo-ovarian cyst acutely inflamed; hæmorrhage into the cyst. (Amer. Journ. of Obst., Feb., 1887, vol. 20, p. 141, with fig.)

to look like granulation tissue. The walls of the undilated portion of the tube to the naked eye appear healthy, but are also infiltrated by embryonic cells; dilatation of blood-vessels is everywhere evident.

In pyo-salpinx the lower end of the tube may be to a certain extent patent. It has been said that in this "profluent" variety the walls are thicker, but that appears to depend upon the fact that they are not excessively distended. It has also been asserted that under these circumstances the hypertrophy of the muscular fibres can secure evacuation of the contents of the sac, but this seems very doubtful, and it is more probable that it occurs from overflow.

It may happen that the tube is more or less altered, and presents the signs of a chronic interstitial inflammation, while the ovary alone is transformed into a cavity containing pus or presents small circumscribed abscesses. In such cases the inflammation has often become extended by adhesion to and inoculation from the tube which, the first affected, has, no doubt after evacuation of its contents into the uterus, spontaneously taken the direction of chronic inflammation while suppuration continued in the ovary. At other times, since the organs have remained at a considerable distance from one another, indirect ovarian infection through the lymphatics must be admitted. However that may be, it is probable that the formation of abscess in the ovary by tubal infection is usually favoured, and, so to speak, the way is prepared for it by the pre-existence of a small follicular cyst, or cyst of a corpus luteum, or even simply by microcystic degeneration.

Pyo-salpinx may co-exist with uterine tumours, fibroids, or cancer.

Cold abscess of the tube, or tubercular pyo-salpinx, can only be diagnosed with difficulty when no similar disease of the ovary or uterus is present at the same time. On the neighbouring peritoneum, however, there may be characteristic tubercular granulations; with regard to caseous masses found in the tubes, they may be produced by simple inspissation of the pus, and the cavernous appearance to which old writers used to attach so much importance is now known to be of only very moderate worth. The microscope alone can settle the question by revealing the special cellular structure of the tubercle with its lymphoid cells

grouped around a giant cell, and especially Koch's tubercle bacillus. Hegar and Orthmann have met with it, but as with Neisser's gonococcus in gonorrhœa, it may not be found (because it has disappeared) without there being the least doubt about the specific nature of the lesion.

Hydro-salpinx,* or dropsy of the tube, is from an anatomical point of view the oldest known lesion of the tube. But there is no doubt that it has often been confused with certain tubo-ovarian cysts, in which the tube itself is nowise dilated but simply elongated, hypertrophied, and adherent to an ovarian cyst, with the cavity of which it communicates. It is in this way that is to be attributed the immense size that some old writers, and even some modern ones (Peaslee), attribute to hydro-salpinx. It is doubtful whether these tumours can exceed the head of a fœtus in size. Generally they are no larger than a small pear. Their appearance is smooth and their colour bluish-white; the walls are very thin, transparent in places, and like paper. Generally there is little adventitious increase of the thickness of their walls, or rather they are thin and distended, inasmuch as dropsy of the tube always corresponds with an inflammation of old date that is now actually extinct.

Froriep,† who long ago studied this lesion very carefully, divided hydrops tubæ into two varieties, aperta and occlusa, according as the uterine extremity was patent or occluded.

The contents are pale yellow; occasionally a little blood or a few puriform flocculi are mixed with it.

Hæmato-salpinx ‡ must be absolutely distinguished from small hæmorrhages or hæmatomata of the tube which distend the simply inflamed walls of the oviduct. These extravasations of blood, which may be absorbed, constitute an accident rather than a disease. Hæmatocele of the tube, or true hæmato-salpinx,

* A very clear diagram of hydro-salpinx was given nearly two centuries ago by Abraham Cyprianus in his "letter relating the history of a human fœtus of 21 months," Amsterdam, 1707, p. 22. This lesion was found in the body of a woman who became sterile after a difficult labour. A similar figure exists in Dekker's "Exercitationes practicæ," Leyden, 1695, according to Greig Smith. Abdom. Surgery, London, 1887, p. 157 (note).

† R. Froriep. Beobachtung einer wahren Sackwassersucht der Fallopischen Trompeten. (Med. Zeit., Berlin, 1834, No. 1, p. 3 and foll.)

‡ One of the first anatomical observations of hæmato-salpinx was made by Béraud. (Becquerel. Clinical treatise on dis. of the uterus, 1859, vol. 2, p. 280.)

means at the same time profound changes in the walls of the tube, which have definitely assumed a cystic conformation, and modification of the blood such as occurs in hæmatocele. It is in a word a stable lesion, and not a transitory pathological condition, as is simple extravasation of blood in an inflamed organ. But since preceding distinction has not been made by writers, I must conform to general custom.

If cases of retention of the menstrual blood from atresia of the genital tract be left on one side, and this condition is treated of in the special chapter on malformations, we have left two chief varieties of hæmato-salpinx.

1. The first, which is without doubt the most common, and of which I have just spoken, is apoplexy of the tube, which may incidentally supervene in the course of a catarrhal inflammation, or even in the course of a menstruation upset by a change in *régime*, by excessive fatigue, or by a chill in neuropathic or plethoric subjects. It is possible that the symptoms attributed by certain writers to "congestion of the uterus," or "pelvic congestion," have this cause of origin. The lesion does not generally persist, the clot is absorbed, and the symptoms may gradually pass away so long as they have not been engrafted, though they very often are so, upon the symptoms of chronic parenchymatous salpingitis.*

2. The second variety of hæmato-salpinx, the only one that possesses a definite anatomical personality, is characterised especially by the presence of a sac similar to that of pyo-salpinx. That this sac may come into existence there must be admitted, I

* There is no doubt that the mucous membrane of the tubes is the seat of an exudation of blood during menstruation. According to Puech, there occurs a physiological hæmorrhage in the tubal cavity as in the uterine cavity. When the stump of the tube is fixed to the abdominal wall after ovariotomy by the clamp or extra-peritoneal ligature, oozing is very often seen to occur from the divided surface at the monthly periods. Spencer Wells. Diagnosis and treatment of abdominal tumours, French trans., 1886, p. 168.—A. Poncet. Thesis, Paris, 1878, p. 28.—T. E. Prewitt. Amer. Journ. of Med. Sciences, April, 1876, vol. 71, p. 422.—Lawson Tait. B. M. J., 1878 vol. 1, p. 933.—Migrew. Amer. Journ. of Obstet., Sept., 1884, p. 912.—This physiological hæmorrhage is therefore, if not constant, at any rate of very frequent occurrence, and it would be likely to appear very easily when any cause whatsoever arises to increase the active or passive congestion of the generative apparatus. If the hæmorrhage take place when the extremities of the tube are patent, it is extremely likely to pass completely into the uterus and give rise to no trouble (physiological condition); but if it be more abundant it may lead to the formation of clots in the interior of the tube, and to ill-developed morbid phenomena, until they have been absorbed; if it be excessive, a retro-uterine hæmatocele may be the consequence.

think, either a tubal pregnancy arrested in its development by the early death of the embryo which is absorbed,* or again, a preceding pyo-salpinx which has obliterated the fimbriated extremity and thickened the walls in proportion to their dilatation; hæmorrhage then supervening into a pathological cavity, the walls of which are incapable of absorbing, becomes in consequence definitive. Sometimes the change from pyo- into hæmato-salpinx is made directly; sometimes there is an intermediate stage of hydro-salpinx, and in these cases the liquid contents are clearest and the walls thinnest.

Inversely, a hæmato-salpinx may secondarily undergo suppuration. Infection then doubtless occurs much rather through the lymphatics than through the intermediation of the uterine cavity, with which all communication is interrupted. The size of these sacs does not generally exceed that of a pear, though Lawson Tait speaks of one which extended above the umbilicus, and contained several litres of fluid. It seems to me difficult in this case not to admit that there was at the same time an encysted intra-peritoneal hæmatocele joined to the hæmato-salpinx.

Hæmato-salpinx is often seen to coincide with fibroma; it is not to the pressure of these tumours on the ostium uterinum that it is attributable, but much rather to the hæmorrhagic metro-salpingitis that accompanies the development of fibromata.†

The sac wall in hæmato-salpinx is thickened in some places, thinned in others. Hypertrophy of the muscular fibres may be met with here as in pyo-salpinx. Communication with the uterus may persist. With regard to the contents, they may consist of syrupy chocolate-coloured blood (chiefly in cases in which the condition is due to retention of menses from genital malformation), or more commonly of a clear liquid formed of serum mixed with blood, or pus mixed with blood. Clots in it

* A. Martin. (Centr. f. Gyn., 1889, No. 40, p. 689) showed at the 62nd reunion of German naturalists and medical men at Heidelberg, a specimen of hæmato-salpinx in which, though there was no trace of a fœtus, he had discovered chorionic villi.—The latter ought always to be sought for before giving an opinion upon the nature of a tubal sac.

† Von Campe. Verhandl. der Berl. Gesell. f. Geb. u. Gyn., 1883.—A. Th. Wyder. Arch. f. Gyn., 1878, vol. 13, p. 35.

may form layers on the sac-wall, or small, free, fibrinous masses (fig. 326).

Histological examination of the sac shows that the process is less irritating than that in pyo-salpinx. However, even then one finds the mucous coat unusually rich in fusiform cells,

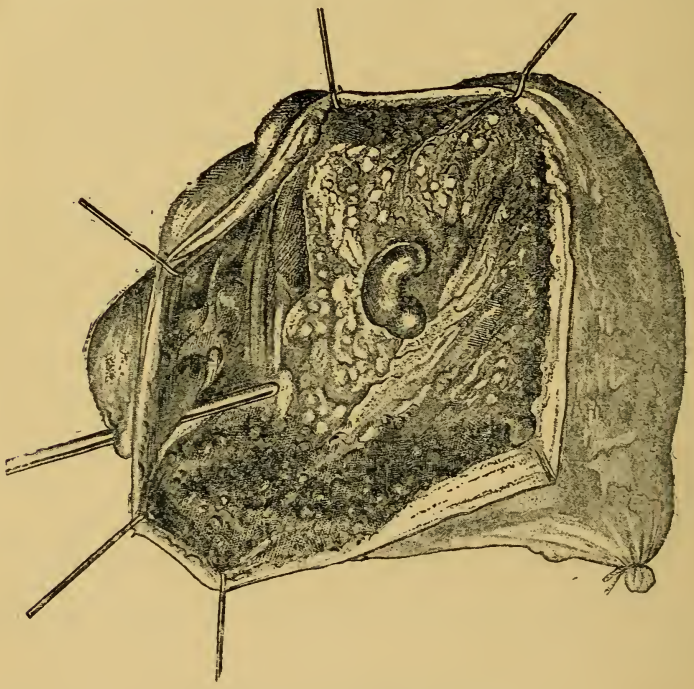

Fig. 326.—Suppurating hæmato-salpinx.

The sac is opened: the tuberculated appearance of the internal surface and a small reniform body (clot or embryo?)* are visible. A director is passed through an opening by which the sac communicated with the rectum. A ligature is placed on the uterine extremity. (Specimen removed by laparotomy.)

which in some folds seem to rise perpendicularly from the deep layers. The summits of these folds are generally denuded of epithelium. The intervals between them may contain a rich

* The small reniform body represented in the figure, which had been regarded as a blood-clot at the time when the specimen was drawn, and which afterwards was unfortunately lost, may have been a clot or an embryo, in which case the hæmato-salpinx was only the transformed sac of a tubal pregnancy very easily arrested in its development by apoplexy, upon which suppuration followed. The patient whom I operated upon in January, 1887, rapidly recovered; the case has been published. Cf. Riskallah, Thesis, Paris, 1889. (Case 5.)

network of capillaries engorged with blood, that can be followed close up to the surface of the mucous coat. At many spots small interstitial hæmorrhages mask the network of the tissues (fig. 327).

II. *Cystic ovaritis.**—Microcysts or cysts of the ovary, with only moderate development, are described along with the inflammation upon which they depend.

A. *Serous cysts.*—It is common to find a certain number of follicles tense with liquid on the surface of normal ovaries. Here we have probably to do with a purely physiological process only,† a simultaneous maturation of a certain number of ovules

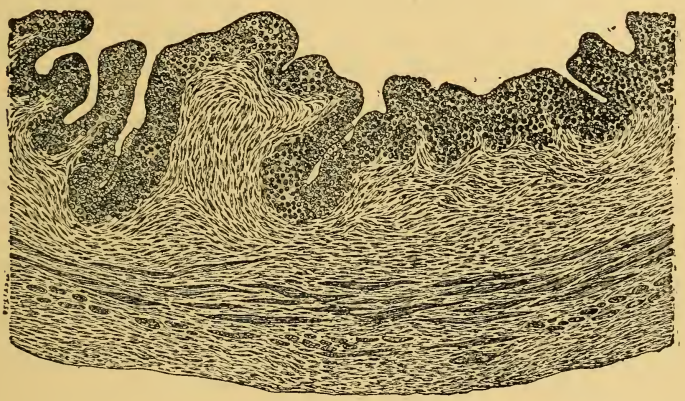

Fig. 327.—Hæmato-salpinx.
Section under a low power (Wyder).

with the view of assuring ovulation. On the other hand, the most competent authorities assert that even in cases in which the peripheral tissues have clearly undergone changes, no histological differences can be found in the existing follicles sufficing to distinguish them from normal follicles in the maturing or retrograding stages. For the diagnosis of a morbid condition, therefore, we must rely upon the multiplicity of these follicles, upon their size particularly, which in the normal state

* Cystic ovaritis is related to cysts of the ovary by pathological anatomy, but clinically it cannot be severed from oophoro-salpingitis, and for this reason, though a portion of the description is given here, we shall be obliged to return to the subject in the chapter on cysts of the ovary.

† Olshausen, *loc. cit.*—Leopold. Arch. f. Gyn., 1883, vol. 21 (Plate 3, figs. 19, 23, and 24).—E. Ziegler. Lehrbuch der allg. u. spec. pathol. Anatomie, 4th edit., 1886, p. 924.—W. Nagel. Arch. f. Gyn., 1887, vol. 31, part 3, p. 327.

should not exceed 2 to 2·5 cm., and upon the presence of accompanying lesions.

Follicular cysts appear as spherical unilocular sacs, varying in size from that of a cherry to that of a walnut, but occasionally reaching to much greater dimensions.* Scattered, or by preference collected, upon the surface of the ovary, they are also met with in its substance. On section they are shown to have a wall of double contour, a smooth surface, and limpid or colourless contents. According to Ritchie and Webb,† no ovule is to be found in cysts larger than a cherry; they seem to disappear, owing to the proliferation of the granular cells that surround them. The parietal epithelium, at first in a state of proliferation, later undergoes colloid or granular degeneration. As to the so-called "lymphoid" layer (Slavjansky), it passes gradually into the cellulo-vascular layer by a common process of fibrosis. In some cases, according to Toupet, we seem to have to do, not with a dropsy of the follicle, but with a dropsy of the ovule itself.‡

I once removed a polycystic ovary in which a certain number of cysts, varying in size from a pin's head to a filbert, were filled with a serous fluid, while others contained a caseous or lardaceous material in which microscopic examination by Toupet in Cornil's laboratory revealed a myxomatous tissue. A process similar to the process of cicatrisation of normal follicles was here probably taking place (cf. infra, figs. 349, 350, and 354).

From a clinical point of view, it is interesting, I think, to distinguish microcystic degeneration accompanied by fibrosis, from the formation of large conglomerate follicular cysts that transform the whole ovary into a partitioned and multiloculated mass, attaining the size of the fist or even the head. I give the name of "cystic disease of the ovary" to this latter variety.

Œdema of the ovary is somewhat common in cases of pelvic

* E. Neumann (Hydrops eines Graaf'schen Follikels mit zahlreichen Eieren in Virchow's Arch., 1889, vol. 104, p. 489 and foll.) has described a multilocular cyst which, according to him, was the result of dropsy of a follicle.—For the criticism of this case, and for that of the whole question of follicular dropsy, cf. Nagel. Beitrag zur Anatomie gesunder und Kranker Ovarien (Arch. f. Gyn., 1887, vol. 31, part 3, p. 327).

† C. P. Ritchie. Contribution to assist the study of ovarian physiology and pathology, London, 1865, p. 197.

‡ Paul Petit. Ovaritis and cysts of the ovary (Nouv. Arch. d'obstet. et de gyn., July, 1888, p. 296).

tumour obstructing the return of the venous blood, and gives rise to a kind of dissociation of the connective tissue of the organ. This process may be pushed so far as to give rise to the formation of pseudo-cysts such as have been described by Paul Petit as occurring in one of my cases.* These pseudo-cysts corresponding to the physiological œdematous bullæ, may be at the first glance confounded with follicular cysts, but are clearly distinguished from them by not having a separate enclosing sac wall, and by collapsing directly they are opened.

B. *Blood cysts.*—Blood cysts of the follicles present different appearances according to the causes upon which they depend. Multiple and of small size, sometimes riddling the organ throughout, they represent the predominating lesion of infective ovaritis of internal origin.† Larger cysts, varying in size from that of an almond to that of the fist, contain a sero-sanguinolent fluid, and seem to result from hæmorrhage into dropsical follicles, or to be composed of almost pure blood. In the latter case the cysts are especially related to cortical sclerosis, and it has been suggested that they may increase in size until they rupture by a kind of intra-cystic ovulation of neighbouring follicles ("menorrhagic cysts" of Boeckel). These cysts have a fibrous wall that is sometimes very thin; their lining epithelium is degenerated or destroyed.

Blood cysts having their seat in the corpora lutea result from an exaggeration of the physiological hæmorrhage after ovulation, or from sudden extravasation into cicatrised corpora lutea. The cysts of the first variety have an almost uniform envelope, in which are to be found, more or less altered, the distinctive elements of the corpora lutea, vitreous masses of degenerated epithelium borne on the summits of the papillæ. The others must be considered as a simple variety of interstitial hæmorrhage.

These cysts are sometimes disseminated, sometimes diffused throughout the whole substance of the ovary, transforming it into a pulp like that of the spleen.

Between intra-follicular hæmorrhage and extravasation into the stroma there is said to exist a mixed variety (Besnier), consisting of a true intra-ovarian hæmatocele from abnormal ovulation.

* Paul Petit. Bull. Soc. d'obst. et de gyn., June, 1891.

† F. Rollin. Hæmorrhage into the ovary. Thesis, Paris, 1889.—Slavjansky. *loc. cit.*

C. *Purulent cysts.*—Suppuration of the ovary shows itself first of all under the form of multiple abscesses,* of small size and clearly defined, which seem to be seated principally in the ovi-sacs, if one can judge from their form, and from the remnants of epithelial cells that are to be found on their walls. By degrees these cavities become united by ulceration of the interposed cellular tissue and come to form larger or smaller cavities, and sometimes even one single sac. The wall of the large abscess, from within outwards, is composed of an embryonic layer, a dense fibrous layer, and, lastly, a vascular layer, in which the elements of the organ are to be found, more or less altered. Amongst purulent cysts are probably to be included the cysts by circumscribed softening, described by Rindfleisch and Mayweg.

D. *Lymphatic cysts.*—These pseudo-cysts, probably always dependent upon ovarian varicocele, may reach the size of small follicular cysts. They appear as stellate masses lined with flattened cells, and enclosing a certain number of leucocytes.

All these microcysts, so different in kind, and containing serous, bloody, or purulent contents, are generally associated one with another, and have as a common characteristic their inflammatory or simply irritative origin, and their restricted development. It seems absolutely certain that they cannot be transformed into proliferating cysts. At a given moment they empty themselves either into the abdominal cavity (blood cysts), or into the neighbouring parts (purulent cysts), or else they undergo atrophy from absorption of their contents.†

Symptoms.—It may seem strange, *a priori*, that one should endeavour to present simultaneously the clinical symptoms afforded by collections of pus and collections of serum and blood of the tubes and ovaries. It is because it is difficult, unless it be verified by clinical observation, to imagine that a woman can carry about in her abdomen one or two sacs filled with pus and not present grave symptoms, not even, sometimes, seem to suffer from it at all. Between the initial period of formation and the ultimate period of inflammation of the neighbouring parts, and

* Streptococci have been found in the pus of an abscess of the ovary. J. Veit. Berlin. Obstet. and gyn. Soc., Dec. 13, 1889 (Centr. f. Gyn., 1890, p. 66).—R. Schoeffer. Zeitschr. f. Geb. u. Gyn., 1890, vol. 20, part 2, p. 281.

† I am indebted to M. Paul Petit for editing the passage relating to the pathological anatomy of cystic ovaritis. I am sincerely grateful to him for it.

spontaneous efforts at evacuation, pyo-salpinx passes through a torpid and, so to speak, latent stage, during which the economy, perfectly protected by the completely encysted condition of the septic material, seems to tolerate its presence.* The objective symptoms are then exactly similar to those of chronic salpingitis, and the physical signs do not differ in the least from those of hydro- or hæmato-salpinx. The picture of all may therefore be presented at one time, though a few special remarks must be added relative to the acute periods of abscess of the tubes.

The picture does not sensibly differ from that which I have already traced when dealing with non-cystic salpingitis. There are the same pains, the same disorders of menstruation (amenorrhœa, dysmenorrhœa, menorrhagia); nevertheless the latter may exceptionally be wanting, and the catamenia be in no way disturbed.†

In hæmato-salpinx, Puech has sometimes seen a continuous discharge of blood occurring in very small quantities, and in the absence of true menstruation. This is the phenomenon that some writers have called "distillating amenorrhœa," but there is nothing pathognomonic therein; it may also be met with in metritis.

I must mention yet another accessory sign, the value of which has been greatly exaggerated. I mean the sudden discharge, following on an attack of pain, of serous, sanguinolent, or purulent fluid; this phenomenon may occur at irregular intervals, every month or every six months, for example. Does it depend upon the patency of a uterine orifice which is from time to time opened up by excessive fulness of the cyst? Or is it simply an expulsion of the contents of the inflamed uterus itself by reflex contractions of its walls? If we take into consideration the extreme frequency of obliteration of the cystic tubes on the uterine side, we shall be often tempted to adopt the latter explanation. Be that as it may, this peculiarity was long ago noticed by observers; it constitutes the hydrops tubæ profluens

* Lawson Tait (B. M. J., June 4, 1887, vol. 1, p. 1211) relates that he removed from the wife of a brother practitioner a bilateral pyo-salpinx on the point of breaking, and which would very probably, he says, have killed the patient within a week, though it had never caused her the least suffering; the eminent surgeon had the greatest trouble in the world to induce the husband to give his consent to the operation.

† L. Championnière. Bull. et Mém. de la Soc. de Chir., Jan. 18 and Feb. 8, 1888, pp. 65 and 145.

of Froriep. Klob, taking his stand upon observations made in old women, thinks that some of the imaginary returns of menstruation after the menopause may be explained in this way.* Occasionally by pressing upon the tumour in the abdomen, the contents have been seen to trickle into the vagina.† The flow of pus caused by pressure on the abdomen, or pyo-metrorrhœa, has often been pointed out as an incontrovertible sign of pyo-salpinx.

Two groups of symptoms alone are sufficiently characteristic—the pains which call attention to the appendages of the uterus; and local examination revealing a definite tumour on the side of the uterus.

The physical examination must be made by bimanual and rectal examination combined. The greatest care should be taken while carrying it out, since serious and even fatal accidents have arisen from rupture of a pyo-salpinx, when the examination has not been performed with sufficient gentleness.

Cystic tumours of the tubes present very different characters according as they are free, and up to a certain point movable on the sides of the uterus, or as they have fallen into Douglas' pouch, where they have contracted adhesions.

In a typical case where the tumour is free the two hands are able to grasp between them a small elongated mass, in shape like a sausage or a pear, attached to the sides of the uterus, from which it is usually separated by a kind of groove, which is formed by the narrower and less accessible pedicle. When the tumour is bilateral, it feels as if a bag had been thrown from one side of the uterus to the other. Fluctuation is only rarely obtained, but pain is always evoked if the patient be not anæsthetised. At other times, while this sensation is felt on one side, on the other the whole vaginal cul-de-sac, with the posterior cul-de-sac, is occupied by a globular tumour, of elastic or fluctuating consistency, which seems to be one with the posterior surface of the uterus. This is a tube dilated in the shape of a retort, the belly of which is fixed in Douglas' pouch and raises

* Bequerel (Clinical Treatise on Dis. of the Uterus, 1859, vol. 2, p. 279) reports three similar cases occurring in old women at the Salpêtrière.

† Hausamann (cited by Güemes. Thesis, Paris, 1887, p. 64) has published a case of this kind. The patient was a young girl with hæmato-salpinx, under the care of Frankenhäuser. Routier (Bull. et Mém. Soc. de Chir., Oct. 12, 1887, p. 547) has published a case of pyo-salpinx which seemed to be emptied by pressure.

the uterus, while at the same time it depresses the rectum. If the tumour contain pus, it will still for some time preserve its independence, but later may become adherent to the surrounding parts in such a way as to become transformed into a genuine non-enucleable abscess, situated in the pelvic walls; in a word, a pelvic abscess.

Diagnosis.—Is it always possible to distinguish pyo-salpinx from serous or blood cysts of the tube? I have already said that one should be extremely cautious in giving an opinion, considering the length of time for which a bag of pus that is strictly limited, may be tolerated. Nevertheless pyo-salpinx will be suspected if dilatation of the oviduct occur after gonorrhœal or puerpero-gonorrhœal infection, and if the tumour be greatly adherent. When intermittent or permanent purulent fistulæ are found, there is no longer any doubt. The only diagnosis that then remains to be made is that of the exact limitation of the disease, and of its possible transformation into a pelvic abscess. But in doubtful cases it must be confessed the question may not admit of a solution until after the abdomen has been opened.

Hydro-salpinx and pyo-salpinx are almost always bilateral; hæmato-salpinx is most generally unilateral.* The question suggests itself whether this fact is not because hæmato-salpinx frequently arises from a tubal pregnancy arrested in its development. Further, pyo-salpinx may be present on one side and hydro-salpinx on the other.

If the tubal swelling be of very considerable size, and not to any extent adherent, it is probably a hydro-salpinx; in this case pressure also causes less pain than in pyo-salpinx.

When the tumour is still free, an encysted collection of fluid in the tube may be confounded with the early stage of an ovarian tumour, and particularly with a parovarian cyst. The latter is, however, more clearly lateral in position, and is not usually separated from the uterus by the interval which corresponds with the pedicle of the tubal cyst.

The diagnosis of tubal pregnancy during the first four months is confessedly almost impossible. Most operations in which these fœtal cysts have been removed had been instituted for supposed salpingitis. Hypertrophy of the uterus and expulsion of a decidua are the only signs of probability, for menstruation may persist.

* C. Hennig. Die Krankheiten der Eileiter, Stut'gart, 1876.

Uterine fibroids are one of the conditions to which an inexperienced observer is particularly liable to refer large serous or blood-containing cysts of the tube. It is sometimes almost impossible to distinguish them at the first examination. But careful passage of the uterine sound shows great increase of size of the uterus with fibroids, but its normal size with the tubal affection. Moreover, fluctuation is always perceptible in hydro- and hæmato-salpinx when they are of a certain size, provided the patient be anæsthetised before the examination; one is then surprised to find a perfectly different sensation from that which was obtained before the anæsthetic was given. Adherent pyosalpinx projecting into Douglas' pouch often gives rise to the sensation of a vagina made of cardboard (vagin de carton).

When in doubt, is it permissible for the purposes of diagnosis to make an exploratory puncture? I reject the proceeding as dangerous, however close the tumour be to the point at which the needle is inserted, be it abdominal wall or vaginal cul-de-sac. There is a danger of wounding the intestine, and there is the greater danger of allowing the effusion of a septic fluid into the peritoneal cavity, either primarily, if in spite of aspiration the whole of the contents have not been evacuated; or secondarily, if when the cyst refills it separate the lips of the small wound that have only recently become united.

This exploration, which seems insignificant to the patient and her friends, is in reality more dangerous than an exploratory incision performed with antiseptic precautions. Certainly the latter course must not lightly be undertaken; but one must not lose sight of the fact that it is one of the most valuable resources of modern surgery.*

* Lawson Tait, at a conference held at Jefferson Medical College, Sept. 15, 1884, said, "Experience has taught me that it is a surgical crime to allow a patient to go down to the grave without operation, when operation presents a chance of relief."—Lawson Tait makes a very small incision (2—3 inches) sufficient for the introduction of one or two fingers. The whole exploration is to be carried out by touch uncontrolled by sight.—Gaillard Thomas (Med. News, Philad., Dec., 1886), in an article entitled "Laparotomy as a means of diagnosis," expresses the same views as Lawson Tait. He would like to see written on the walls of every hospital where abdominal surgery is performed this aphorism: "When there exists a doubt as to the diagnosis of an abdominal new-growth giving rise to serious symptoms, or of an undetermined morbid condition of the abdominal cavity threatening life, give the patient the chance of an exploratory incision."—Cf. also on this subject Joseph Price, Obstet. Soc. of Philad., April, 1887 (Amer. Journ. of Obstet., 1887, vol. 20, p. 749).

The diagnosis between a large cyst of the tube and a fibro-cystic tumour of the uterus is in certain cases almost impossible, however, the increase in length of the uterus, measured by the sound, may in the latter case aid the diagnosis. Here exploratory puncture would always be particularly dangerous.*

Pelvic adenitis, a rare condition and often of undetermined origin, has caused errors in diagnosis. The rational symptoms to which it gives rise, the tumour which it forms, have simulated those of adherent pyo-salpinx. An interesting case of the kind has been reported by Terrier, and L. Championnière and myself have seen analogous cases. †

Lastly, pregnancy complicated by bi-lateral pyo-salpinx has been observed, and the complex tumour to which it gives rise has only been explained after exploratory laparotomy.‡

Doléris§ has related two curious cases of enterocele adherent in Douglas' pouch, in which the painful phenomena and the physical signs furnished by examination had led to the diagnosis of an inflammatory tumour of the appendages. The tumour that was felt by touch to be behind the uterus was composed of coils of intestine, agglutinated by adhesions. Removal of the appendages performed in these two cases had been followed by no relief. I have seen‖ a similar case, in which, however, the symptoms were sub-acute and seemed to start from a peri-salpingitis, although the tubes had undergone but little change. Laparotomy, followed by breaking-down of the adhesions, washing-out of the peritoneum, and drainage, brought about a rapid recovery.

Progress. Duration. Termination. Prognosis.—One may assert that encysted collections of fluid in the tubes form a definitive disease, irremediable except by extirpation ; the women who are the subjects of them are invalids whom the least fatigue exposes to acute attacks of peri-salpingitis ; the progress, moreover, of these affections is essentially one of repeated attacks or relapses, just as practitioners had long ago seen was the case

* Schröder. Die Krankh. der weibl. Geschlechtsorgane, 1886, p. 243.

† S. Pozzi. Bull. et Mém. de la Soc. de Chir., April 14, 1886, p. 300.—Terrier, L. Championnière. Ibid., July 3, 1889, pp. 551 and 555.

‡ Sacré. Brussels obst. and gyn. Soc., July 21, 1889 (Centr. f. Gyn., 1889, No. 39, p. 683).—Porro's operation was performed and the patient recovered.

§ Doléris. Some points in the differential diagnosis of oophoro-salpingitis (Nouv. Arch. d'obst. et. de gyn., August, 1889, p. 357).

‖ S. Pozzi and Baudron. Revue de Chir., August, 1891.

with peri-uterine cellulitis and pelvic peritonitis. In point of fact these tubal lesions were till quite lately confused, and included under this name with the secondary inflammations to which they give rise. The acute attacks are particularly marked by exacerbation of all the painful and nervous phenomena in the case of non-purulent tumours; sudden rises of temperature, with occasional remittance of fever that is almost complete, are the rule. L. Tait has attributed these repeated attacks to the escape of a few drops of irritating liquid through slight lacerations of the tube.* However that may be, slight attacks of peri-salpingitis are constantly recurring. Lastly, complete rupture may occur. Then, if the case be one of hydro- or hæmato-salpinx the symptoms may be relatively slight† (as in the case of rupture of an ovarian cyst). But if the case be one of pyo-salpinx bursting into the peritoneal cavity, formidable and fulminating symptoms are produced, the cause of which is sometimes unrecognised. The practitioner should be warned of the possibility of these rapid deaths which may carry off women apparently in very good health; these cases are comparable in their unexpected severity to rupture of an ectopic gestation.

When the tubal sac filled with pus cannot empty itself through the uterine orifice, it having become definitely obliterated, and when the infective process has not exhausted itself, the pus which continues to be formed distends the sac excessively and brings it into contact with the neighbouring cavities, rectal or vagina, to which the sac then becomes adherent, perforates, and so finds an exit. The opening thus made tends to be constantly re-opened, and thus a fistula is formed. They are especially seen opening into the rectum, the pyo-salpinx being generally prolapsed into Douglas' pouch. More rarely the pus opens up a way for itself directly into the vagina, the bladder, or the ureter.‡ Pain, tenesmus, and glairy diarrhœa (Nonat) precede opening into the rectum; symptoms

* Lawson Tait. Treatise on Diseases of the Ovaries. French. transl. by Olivier, 1886, pp. 92 and 150.

† A case has, however, been cited of death from rupture of a hydro-salpinx following upon dilatation of the cervix and lowering of the uterus. A. Mermann. Centr. f. Gyn., 1881, p. 513.

‡ Wylie. Complication of Salpingitis: right tube adherent to ureter. (Amer. Journ. of Obstet. 1891, vol. 24, p. 344.)

of cystitis announce opening into the bladder. A recto-vesical communication may be formed by openings in both directions.

The discharge through these fistulæ is generally intermittent; after a premonitory storm of fever and pain the pus suddenly bursts through; remarkable and immediate relief is experienced, and the patient, who sometimes seems to be *in extremis*, obtains a new lease of life; she recovers in appearance more or less completely until a fresh attack again lays her low. Alternations like these may go on for some considerable length of time without profoundly altering the general state of health. But sometimes these attacks reveal an extreme degree of sepsis, and the thermometer rises up to 106° F.; violent rigors, delirium, profound alteration of the features, indicate the intensity of the infection. After several relapses the patient remains enfeebled, and at the mercy of the hectic fever that is wearing her out. Extreme anorexia is one of the most striking characters of this morbid state; some women cannot keep down the lightest nourishment, but vomit everything, and literally die of inanition.

There is another clinical variety in which the fistula, permanent or intermittent, scarcely provokes any reaction but gradually induces general decay.

A pyo-salpinx may also make an opening for itself laterally, towards the iliac fossa, by forming abscesses in this region, or forwards into the pre-vesical cellular tissue, giving rise to a special variety of suppuration in the cavity of Retzius. These lesions, which will be separately considered in the following chapter, pass from the category of circumscribed inflammation to enter into that of pelvic abscess.

When a relative cure is spontaneously obtained, the plastic residues that imprison and displace the uterus and its appendages constitute a permanent source of pain and a perpetual source of anxiety with regard to the return of acute inflammation. Moreover, the tubes, even after their contents have been evacuated, remain affected with interstitial salpingitis, at first hypertrophic and later atrophic, that perpetuates the pain.

Treatment.—More than a century ago Louis wrote, "Many diseases which reduce physicians to despair are very easily cured by the assistance of surgery." And these words have never found a more brilliant demonstration than in affections of the tubes. But very few years ago women who were the

subjects of them handed over to expectant medicine, were condemned, some to a perpetual life of infirmity, others to a slow and painful death. At the present day surgery cures them almost with certainty.

Is it possible here to resort to the indirect treatment that I have recommended for non-encysted salpingitis? Many high authorities, such as Walton, Doléris, Gottschalk, &c.,* have conceived the idea of emptying the liquid contents of the tubal sac by unstopping, so to speak, the uterine orifice by means of curettage and dilatation of the uterus. It is sufficient to call to mind the pathological anatomy of such lesions, the complete and definitive obliteration of the lumen of the tube, in the immense majority of cases, to see how little theory supports such a hope. The genuine improvement and recoveries that have been observed after this treatment have certainly been in cases of serous peri-salpingitis wrongly taken for cases of pyo-salpinx.

As to the idea of evacuating the contents of the tubes by catheterising them, it scarcely deserves serious mention. The possibility even of penetrating into a healthy tube is very doubtful,† but with a diseased tube the procedure would be both illusory and dangerous.

As soon as one has diagnosed definitely an encysted tumour of the tubes, its removal must be set about, while a suitable time for the operation must be fixed upon. If possible no operation should be undertaken during the progress of an acute exacerbation. However, if the latter present grave features and threaten to set up general peritonitis, and particularly if the surgeon have some reason to fear the possibility of rupture of a pyo-salpinx, the abdomen should be opened without loss of time; this course will be the only one that will offer the patient the least chance.

* Walton. Contribution to the study of pelvic peritonitis, its treatment by forcible dilatation and curettage of the uterus. (Paper read before the Roy. Acad. of Med. of Belgium, July 30, 1887, and published in the Transactions, 1888, vol. 8).—Drainage of the uterine cavity in cases of pelvic abscess (Annal. and Bull. de la Soc. de méd. de Gand, 1888, p. 102). Walton supports his therapeutic propositions on a very doubtful experiment made with a hollow india-rubber ball that he dilates with a Gariel's pessary. The application that he makes of it to pathological conditions seems to me very open to criticism.—Doléris (Comptes rendus de la Soc. de Biol., Dec. 21, 1888) reproduces the foregoing ideas. In a more extended article (Paris Med. Journ., 1889, Nos. 7 and 9) he relates his experiments on the cadaver and on pathological specimens, but they are not very convincing.—S. Gottschalk. Zur Behandlung der Pyo-salpinx. (Deutsche med. Zeit., 1889, No. 30, p. 351.)

† A. Martin. Arch. f. Gyn., 1884, vol. 24, p. 305.

The operation of oophoro-salpingotomy performed under these conditions presents difficulties that are incomparably greater than if the case be one of catarrhal salpingitis. The large number of the adhesions and the danger of rupturing a sac full of liquid ready to infect the peritoneum will call for the exercise of the greatest precautions. As a rule, a larger incision is needed than that for castration properly so called. Sometimes one comes down upon an omentum adherent to the pubes and swollen with bullæ of serum (acute œdema), which completely alters its appearance; it must be stripped off by means of the fingers enveloped in compress-sponges, and if it be much altered must be resected in small portions after having been ligatured with catgut. The fingers now must make out the fundus of the uterus, and by following the cornua the tubes and ovaries will be felt. As soon as the surgeon has made out which tube is the more altered, he will turn his attention to it, will endeavour to sweep his finger around it, and separate it from the neighbouring parts if it be adherent. When the sac is of great size and its walls are very thin, for fear of rupturing it its contents should be aspirated by means of Potain's or Dieulafoy's aspirator, after which the puncture should be closed by placing over it one or two forcipressure forceps. If it be small, firm, and resistant it is better, using care, to detach it without emptying it; by this means much greater power is given to the action of the fingers. When the tumour is freed and only hangs to the broad ligament by the expansions of the tube and ovary, this membranous pedicle is transfixed with a blunt needle threaded with silk, which is tied either by Lawson Tait's knot or by two crossed threads, or by a series of chain ligatures if the pedicle be too large. If adhesions rendered the commencement of the decortication of a cystic tube bound down in Douglas' pouch extremely difficult, the surgeon may commence by dividing the tube between two ligatures at 1 cm. distance from the uterus, a point at which it is generally but little altered, not dilated at all, and offers a true pedicle; this procedure will give him more room, but then the adhesions will have to be broken down from within outwards, instead of from without inwards.

I shall here mention an error that might be caused by adhesion of the vermiform appendix to the tumour; confound-

ing it with the pedicle of the tumour would be a very dangerous mistake.

The cut surface of the tube should be cauterised with the thermo-cautery with an antiseptic object, for it always presents at the centre of the stump a slight hernial protrusion of diseased mucous membrane.

When great difficulty is experienced in isolating the parts, one has a natural tendency to enlarge the wound, so as to give more room, and control the fingers by the eyes. Lawson Tait, who has an incomparable experience of the operation, formally condemns this practice. He advises exclusive reliance to be placed on touch, and says that the task should not be further complicated by the necessity of pressing back the bowel, and by retracting the lips of an abdominal wound, that are often very resistant. If at the moment when the pedicle is being ligatured it be found large, stretched, and inextensible, and threaten to be torn by the traction necessary to bring it within reach of the instruments, or if there is danger of its being divided by the tightness of the ligatures, Lawson Tait suggests the following procedure as capable of giving more room: he glides his fingers along the broad ligament up to the level of its insertion into the pelvis, and by scratching it with the nails he lacerates here the serous membrane and the fibrous structure of the ligament; these lacerations do no injury to the vessels, which slip away by reason of their elasticity and mobility. Play is thus given to the broad ligament, and one succeeds much more easily in drawing the pedicle towards the wound, and tying it without tearing or cutting it.*

Lastly, in some exceptional cases† if the finger does not give sufficient information, or if one be afraid to rely upon it alone, it may be necessary to gain the advantage of sight, either by placing the patient in Trendelenberg's inclined position (fig. 328) or by practising evisceration, or temporary extraction of one or several coils of intestine, that must be covered up with warm aseptic compresses. I succeeded thus in easily separating by means of scissors and the thermo-cautery some appendages

* Greig Smith, *loc. cit.*, p. 170.

† I think that this inclined position has wrongly been made a constant rule in salpingotomy (L. Delagenière in Prog. méd., March 14 and 21, 1891). It has the serious disadvantage of facilitating an extensive infection of the peritoneum in case of the rupture of a sac containing pus.

that were closely bound down to the ilium, in a case of pyosalpinx.*

The best method of arresting hæmorrhage in these operations is by compression; for this purpose I use compress-sponges exclusively. The operation is interrupted for a moment, and energetic compression is made with the hands upon compresses

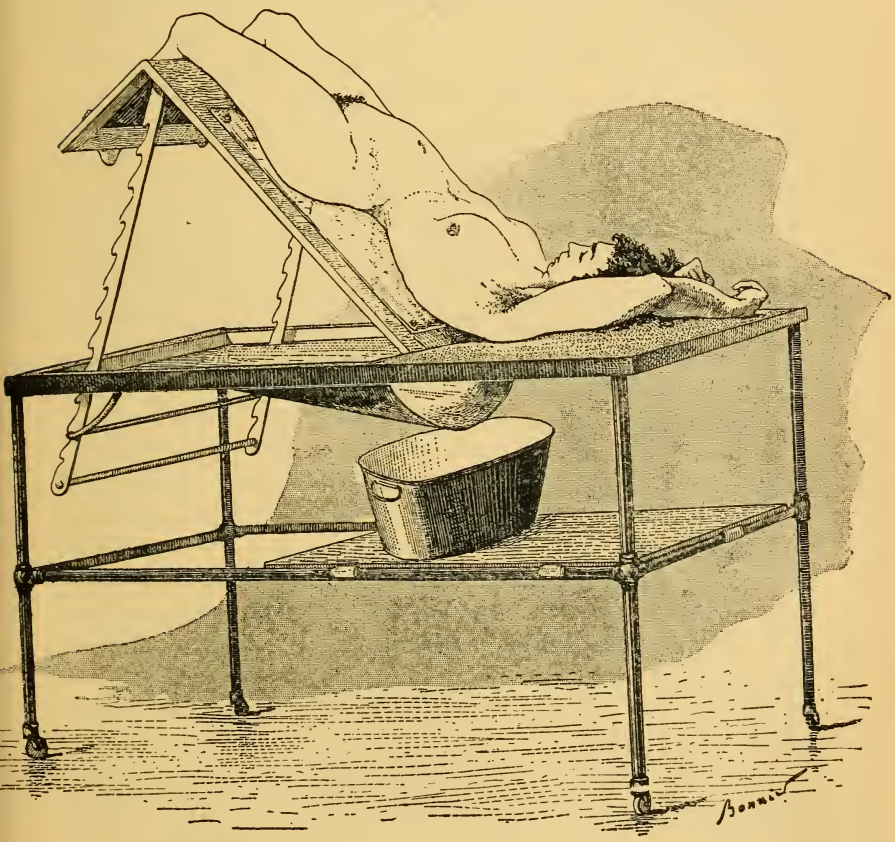

Fig. 328.—Trendelenburg's inclined position on Edebohl's table.

stuffed into the wound. Hæmorrhage coming from the decortication of a tumour filling Douglas' pouch is thus very easily arrested. That arising from laceration of the edges of the uterus may persist; over-casting with catgut is here successful.

* S. Pozzi and E. Bandron. *Loc. cit.*, p. 634.

† Cf. New York Journ. of Gyn. and Obstet., Dec. 1891, p. 149.

Hot water douches, and the thermo-cautery, may be tried if necessary. It is only in a case of absolute necessity that recourse would be had to hæmostatic plugging of the peritoneum with weakly iodoformed-gauze, or even to retention of forci-pressure forceps, and the latter should be reserved to the very last. In the latter case capillary drainage should be added by enveloping the forceps with iodoformed-gauze. Some surgeons have even been forced, when the hæmorrhage came from uterine adhesions, to resort to abdominal hysterectomy before they could arrest the bleeding. When there has been effusion of pus or any irritating liquid into the abdominal cavity, the peritoneum should be washed out, and when the operation has been particularly difficult, and the surgeon has cause to fear abundant oozing along with extensive lacerations, drainage or antiseptic plugging of the peritoneal cavity should be resorted to. The latter precaution is a routine practice with me whenever a fistula exists; it usually then closes up from the commencement without infecting the peritoneum. If this obliteration be delayed, the plugging perfectly protects the serous cavity.*

Is it the right practice systematically to remove both tubes, even when one alone seems diseased, on account of the likelihood of the other to become later affected? I think that course sacrifices the possible fertility of the woman with too little reason, and it would be better to let her run the chance of a second operation. Few surgeons would be so radical on this point as Lawson Tait.

Surgery of the tubes, after having passed through a phase of absolute rashness, seems now to be entering upon a conservative period. I have already noticed the custom of many operators, who content themselves with breaking down the adhesions and antiseptic flushing of the peritoneum in all cases where laparotomy has only revealed a slight degree of alteration of the appendages.

Martin † has occasionally stopped at opening the abdominal extremity of the tube by separating the agglutinated fimbriæ from one another, or at making an artificial opening by partial

* S. Pozzi, Lostalot-Bachoué, and Baudron. Clinical and operative remarks on a series of thirty cases of laparotomy (Annal. de Gyn., May, 1890, vol. 33, p. 251 and foll.).

† A. Martin. Ueber partielle Ovarien und Tubenexstirpation (Samml. klin. Vorträge, 1889, No. 343).

resection of the tube. On 24 occasions he has resected the tube, and on 21 he has resected the ovary.* Skutsch † reports an operation of this kind, for which he proposes the name of "salpingostomy." Instead of extirpating a tube transformed into a serous cyst, he ascertains definitely the character of the contents by aspiration, opens the abdominal end, excises from it an oval piece 1 square centimetre in size, and unites the mucous and serous coats around the orifice with silk stitches. The permeability of the tube is assured by the passage of a sound along it. Skutsch raises the question as to whether it would not be better in such a case to stitch the new ostium to the ovary. Such a course seems to be far preferable.

However, I have but little faith in the utility of this so-called conservative operation, for I believe that whenever the tube presents signs of old inflammation that has been sufficiently intense to transform it into a serous cyst, or even only to have obliterated its abdominal extremity, its structure, and therefore its physiological functions, have become profoundly compromised. On the other hand I attach much value to the operation of partial resection of the ovary, whenever, the tube being healthy, a portion of the ovary is found to be affected. I have sometimes followed this course in fibro-cystic change, and I have on three occasions performed resection of the ovary, to the great advantage of the patients, who preserved their menstruation and fecundity, while at the same time they were relieved of their pain. This operation has also been performed under similar circumstances by Martin, Zweifel, Gusserow, Wiedow,‡ &c.

I have also twice performed salpingorrhaphy,§ that is to say, suture to the ovary of the abdominal extremity of the healthy tube, after I had broken down the adhesions binding it down at a distance from the ovary. In these two cases I had previously resected a portion of the ovary.

One must bear in mind the fact that removal of the tubes and

* A. Martin (Ueber Tuben und Ovarialresektion, in Centr. f. Gyn., 1891, No. 25, p. 515 and foll.) has seen six pregnancies and one miscarriage after resection of the ovary. On the other hand, he has noted only one single pregnancy followed by abortion after resection of the tube, which seems to prove that resection of the tube is an uncertain operation from the point of view of future pregnancies.

† Skutsch. Beitrag zur operat. Therapie der Tubenerkrankungen. Third Congress of German Gynæcologists, Friburg, 1889 (Centr. f. Gyn., 1889, No. 32, p. 566).

‡ A. Martin. Verhandl. der deutschen Gesell. f. Gyn., 1891, p. 242.

§ S. Pozzi. Bull. et Mém. Soc. Chir., Oct. 1891, vol. 17, p. 592.

ovaries may sometimes not lead to good effects until after some weeks or even months. The patient during this time may continue to experience abdominal pain which, although much less severe than before, causes her to lose heart, and believe that the operation has not succeeded in its aim.* This condition may be attributed to two causes: 1. Irritation of the peritoneum at the site of the ligature, which, being applied to inflamed tissues, causes a certain reaction in the immediate neighbourhood; and 2. Persistence of inflammation in the remnant of the tube left at the operation. I therefore believe that the tube should always be divided as near as possible to the uterus, leaving only so much as is absolutely necessary for the application of the ligature. Lastly, every operation on the tubes should be followed by curettage of the interior of the uterus, combined with iodine injections, so as to modify energetically the concomitant endometritis, and at the same time cure the inflammation that lurks in the stump of the tube. As a rule I do not perform curettage until after the end of the first month.

The menopause does not necessarily supervene immediately upon the removal of both tubes and both ovaries. The cases in which menstruation persists for a longer or shorter time seem often to depend upon a condition in which some lesion of the uterus (endometritis, &c.) plays the part of an irritative stimulus; and hence the advisability of treating it secondarily. Removal of the tubes alone, on the other hand, does not lead to cessation of the catamenia, in spite of the fact that Lawson Tait regards these organs as playing the chief part in the menstrual function. Nevertheless salpingotomy alone (without oophorectomy), as may readily be understood, brings sterility in its train.

Statistics of the operation (oophoro-salpingotomy for inflammatory lesions, Lawson Tait's operation).—Statistics, to have a real value, and to allow of the formation of an opinion on the gravity of the operation, must be drawn up strictly in accordance with the following categories:—

1. Acute catarrhal oophoro-salpingitis (non-purulent);
2. Purulent oophoro-salpingitis;
3. Chronic oophoro-salpingitis;
4. Cystic oophoro-salpingitis, serous and hæmatic.

* H. Coe. Amer. Journ. of Obstet., 1886, vol. 19, p. 561.

Unfortunately there are but few published series in which these distinctions can be drawn. But in any case, one is justified in concluding from the known statistics, that the operation is ordinarily benign. It only becomes really serious if suppuration has extended beyond the appendages and invaded the neighbouring cellular tissue and peritoneum. The presence also of a purulent fistula, alone, and even if it be accompanied by a sac otherwise well limited and easily enucleable, no doubt makes a difference in the prognosis of the operation. The general condition of the patient's health ought also to be taken into great consideration; some of them have become exhausted to such a degree that the operation, being performed *in extremis*, has a very poor chance of success. Nevertheless positive resurrections are sometimes seen in these last cases, and the surgeon has no right to refuse a patient this, the only hope of recovery.

I shall content myself with reporting one or two of the most recently published series. I remark once more that they unite discrepant facts in which the appendages have been extirpated for inflammatory lesions of very dissimilar severity.

Imlach,* out of 41 operations, has had 3 deaths; Lawson Tait,† out of a series of 326 cases, 10 deaths. Schlesinger,‡ out of 274 cases of laparotomy for inflammations of the tubes that he has collected, found a mortality of 8·76 per cent. A. Martin§ gives the statistics of 72 cases with 12 deaths. Westermark‖ has collected 498 cases performed by 8 surgeons, in which the mortality was 41 (or 8·23 per cent.).

Zweifel¶ has performed oophoro-salpingotomy 77 times, and has had 1 death. Breisky** has performed it in 40 cases with 2 deaths. Boldt,†† out of 68 cases of pyo-salpinx obtained 22 recoveries and 12 improvements; he had 6 deaths and 4 unsuc-

* Imlach. Liverpool med. chir. Journ., cited in Lancet, Oct. 30, 1886.—In two patients in which the removal was unilateral, pregnancy followed and went on to term.

† Lawson Tait, B. M. J., April 16, 1887, vol. i. p. 825, and Bull. méd., Nov. 7, 1889.

‡ Schlesinger. Inaug. Dissert., St. Petersburg, 1887 (Anal. in Centr. f. Gyn., 1888, p. 350).

§ A. Martin. Zeitschr. f. Geb. und Gyn., 1886, vol. 19, p. 310.

‖ Westermark. Nord. med. Arch., Stockholm, 1887, No. 29.

¶ P. Zweifel. Arch. f. Gyn., 1891, vol. 39, p. 357.

** Cf. von Rosthorn. Ibid., vol. 37, part 3, p. 338 and foll.

†† Boldt. Med. Record, New York, May 17, 1890, p. 545.

cessful cases. The remainder of the patients were lost sight of: out of 24 cases of catarrhal salpingitis he had 1 death, 2 failures, 5 improvements, and 16 cures; in 2 cases of tubercular salpingitis he had 2 improvements; out of 9 cases of hydro- and hæmato-salpinx he had 6 cures and 3 failures. Mundé* has removed the appendages in 43 cases with 2 deaths and 4 failures. Lusk† only had 2 deaths out of 65 cases.

Unfortunately, all these series do not relate to lesions of equal and definite degrees of severity. In a series of operations for pyo-salpinx alone, Gusserow‡ obtained 29 recoveries out of 30 cases. Landau,§ out of 52 laparotomies for pyo- and hydro-salpinx, only had one death (intestinal obstruction at the end of eight days).

In France, L. Championnière‖ has published the following results: 65 times the appendages were removed, and 10 times adhesions were broken down, with one death only. Le Dentu¶ has only lost one patient (from septic peritonitis) out of 34 operations (one patient is not cured, and another suffers from a fæcal fistula). Terrillon has removed the appendages in 140 cases, 84 times for parenchymatous salpingitis, 36 times for purulent salpingitis, 10 times for hæmato-salpinx, 8 times for tubercular salpingitis, and 4 times for hydro-salpinx; he has had 9 deaths. Bouilly from 1887 to 1892 had performed laparotomy 79 times with 9 deaths. Out of 39 cases of pyo-salpinx, he had 6 deaths; out of 40 cases in which the lesion was not suppurative, 3 deaths; or in sum a mortality of 11·3 per cent. (in pyo-salpinx 15·3 per cent., and in the remaining lesions 7·5 per cent.).

P. Segond** has performed laparotomy for diseases of the appendages 18 times without a single death.

The following are the latest results of my practice; a portion of them has already been published.†† They comprise my cases of

* P. F. Mundé. Annals of Gyn. and Pædiatry, 1890, p. 20.

† Lusk. Amer. Journ. of Obstet., 1891, p. 1302.

‡ A. Gusserow. Arch. f. Gyn., 1888, vol. 32, p. 165.

§ Landau. Diagnostiche und therapeutische Erfahrungen über Tubensäcke, read to the Berlin Congress, August, 1890 (Centr. f. Gyn., 1890, p. 16, supplement).

‖ J. L. Championnière. Ovaritis, salpingitis, adhesions, &c. (Journ. de méd. et de chir. prat., Aug. 1889).

¶ Le Dentu. Comptes rendus du Congrès français de chirurgie, fifth meeting, Paris, 1891, p. 175.—O. Terrillon, ibid., p. 180.—G. Bouilly, ibid., p. 184.

** P. Segond, ibid., p. 213.

†† S. Pozzi. The treatment of pelvic suppuration, &c. (Gaz. hebd. de méd. et de chir., April, 1891).

salpingectomy from February, 1889, to January, 1892, and give the following results: out of 135 cases of removal of the appendages for all causes, 6 deaths. Amongst them laparotomy was performed on 80 occasions for parenchymatous salpingo-ovaritis, hæmato- and hydro-salpinx, and fibro-cystic disease of the ovaries, with only one death, which was a case of hæmato-salpinx, secondary to tubal pregnancy and complicated by a hæmatocele; the uterus was very friable, and had been ruptured when the adhesions were being broken down; I was obliged to terminate the operation by abdominal hysterectomy. Lastly, 55 of these laparotomies performed for pyo-salpinx gave me 5 deaths, or a mortality of 9·1 per cent.

Some surgeons (Péan,* Segond†) have recently proposed to substitute for laparotomy utero-ovarian castration per vaginam, in cases of double inflammatory lesions of the appendages, and have obtained a numerous following. Personally, I believe that vaginal operations have been carried too far; the advantages of this operation are more apparent than real, as I shall endeavour shortly to point out.

Is the operation of hysterectomy less severe than removal of the appendages by laparotomy? I shall not lay stress upon the different operative difficulties of laparotomy and hysterectomy; in a discussion of this importance reasoning ought to give way before the experience furnished by statistics. We can only set up against the numerous series of laparotomies that we have enumerated above, P. Segond's table, the only important one hitherto published. Now, out of 64 cases of hysterectomy for diseases of the appendages of all kinds, Segond has observed 8 deaths,‡ or a mortality of 12·5 per cent. If we consider that in this series are mixed up cases of fibro-cystic ovaritis, and of pelvic abscess, we must recognise that no table of laparotomies for diseases of the appendages taken *en bloc* presents a similar mortality.

It has also been asserted that hysterectomy gives more complete and more durable recoveries.

It is at any rate premature to pronounce judgment upon this

* Péan. Compte rendu du Congrès de Berlin and Bull. Acad. Méd., 1890, p. 9 (Bull. méd., 1890, p. 633).

† P. Segond. Vaginal hysterectomy in the treatment of pelvic suppuration. Paris, 1891 (Annal. de Gyn. et d'obstet., 1891, p. 161 and foll.).

‡ P. Segond. Bull. et Mém. Soc. Chir., Nov. 1891, vol. 17 p. 644.

latter point. The patients who were operated upon by Péan's method adopted by Segond were not operated upon a sufficient length of time ago for their value to be pronounced upon. It is for the future to decide whether hysterectomy can hold its own with laparotomy, the definite successes of which have for many years become too common for enumeration.

No doubt the results would be more nearly perfect if in every case extirpation of the uterus were completed by removal of the appendages. But often they cannot be shelled out across a vagina encumbered by forceps, and if it even be attempted it exposes the patient to the risks of rupture of the intestines and hæmorrhage. And, moreover, the advocates of hysterectomy themselves advise the surgeon to be contented with "an incomplete removal and simple opening up of collections of pus within sight and reach of the finger."*

What then is to become of these inflammatory residues left to be thrown off or to be spontaneously absorbed? May not "latent parasitism" one day assert itself in these *débris* of a pyo-salpinx as it is seen to burst out afresh after months and years in old encapsuled deposits? No doubt the advocates of laparotomy leave *in situ* a uterus more or less affected with endometritis, but the discharge or the pain of which it may be the seat after removal of the appendages readily yields to curettage.

Lastly, it has been said in favour of hysterectomy that it avoids all the disadvantages of a supra-pubic cicatrix. This consideration may possibly not be without some weight with the patients, but it really does not deserve to count for much. If a small incision (5 to 7 cm. in length), as is generally sufficient, be made, particularly if one take the precaution to re-unite its edges by the method of suture in stages that I have already described, the scar is no longer unsightly, and after a few months the patients can dispense with a belt without fear of the production of a hernia. †

There is yet one argument in favour of laparotomy upon which I wish to lay particular stress, and it is its diagnostic value. Hysterectomy is an operation that pre-supposes the

* P. Segond, *loc. cit.*, p. 184.

† S. Pozzi. Comptes rendus du Congrès français de chirurgie, fifth meeting, Paris 1891, p. 210.

impossibility of an error in diagnosis, because as a rule there is no time to stop once the operation has been commenced; in point of fact the cases are very rare in which one can make a sufficient examination of the pelvic organs through the button-hole opening in the vagina presented by the incision in the posterior cul-de-sac at the first stage in the operation; laparotomy, on the other hand, allows of the rectification of errors and the solving of doubts; it is always exploratory in the first instance, and it has often been the means of saving organs the lesions in which are found to be in reality much less advanced than was supposed.

For all the reasons that I have just summarised I reject hysterectomy in all the enucleable lesions of the uterine appendages (catarrhal salpingitis, accompanied or not by fibro-cystic degeneration of the ovary, parenchymatous salpingitis, hæmato-salpinx, pyo-salpinx); for these lesions laparotomy seems to me to be the operation of election.

I shall return to the method of performing vaginal hysterectomy when dealing with pelvic abscess, for some exceptional varieties of which I admit its utility.

CHAPTER III.

PERI-METRO-SALPINGITIS.

(PERI-UTERINE INFLAMMATION, PERIMETRITIS, PARAMETRITIS, PELVIC PERITONITIS, CELLULITIS OF THE BROAD LIGAMENT, ADENO-LYMPHITIS, JUXTA-PUBIC ADENO-CELLULITIS, PELVIC ABSCESS, PELVIC CELLULITIS.)

Definition. Localisation. Clinical types.—Historical retrospect of theories. Part played by the cellular tissue, by the pelvic peritoneum, by the lymphatics, by inflammation of the appendages.—Pathological anatomy. Serous peri-metro-salpingitis. Foci of inflammatory œdema. Collections of serum. Suppurative peri-metro-salpingitis. Pelvic abscess. Cellulitis of the broad ligament. Residual slowly-forming abscess. Diffuse pelvic cellulitis. — General ætiology.—Symptoms and diagnosis. Foci of inflammatory œdema: diagnosis from, fibroid, prolapse of the ovary, ovarian cysts, scybala.—Pelvic abscess: diagnosis from, pyo-salpinx, cellulitis of the broad ligament, pelvic hæmatocele.—Cellulitis of the broad ligament: diagnosis from, pelvic abscess, abscess in the iliac fossa, perityphlitis, abscess from erosion of bone, cancer of the ilium.—Diffuse pelvic cellulitis. — Prognosis. — Treatment. Puncture through the vagina. Incision through the vagina, rectum, perinæum, pelvis. Sub-peritoneal and trans-peritoneal laparotomy. Incision in two stages. Incision through the abdominal wall of abscesses that have become superficial. Vaginal hysterectomy for abscess infiltrating the pelvic roof. Method of performing the operation.—Residues of old inflammation. Massage. Electricity. Breaking down of adhesions.—Chronic parametritis. Chronic atrophic parametritis.

THE confusion that has long reigned throughout the interpretation and nomenclature of diffuse inflammations of the true pelvis is even now not entirely dissipated. However, thanks to ideas on inflammation of the tubes recently acquired by a more enlightened study of clinical facts, powerfully supported by particulars observed during operations, we are beginning to arrive at a clearer, and at the same time a simpler conception of them.

At the present time it is known that if the starting-point is often in the uterus (Bernutz and Goupil), it is more often from an oophoro-salpingitis as centre that the inflammation radiates

which invades the neighbourhood of the uterus, the broad ligaments, Douglas' pouch, and the pelvic cellular tissue. It is, therefore, right to bring the appendages into the nomenclature of the disease, and to unite all these lesions under the generic name of peri-metro-oophoro-salpingitis, or more euphoniously peri-metro-salpingitis.

This invasion presents very different clinical features in its progress and intensity according to the ætiological conditions under which it works. Hence we have a series of distinct clinical types, although one and the same pathogenesis unites all the varieties into one common class.

Historical retrospect.—At first the most violent forms were observed, and extensive and rapid suppuration following upon localised septicæmia of puerperal origin, was described. The works of Grisolle and Bourdon* mark this first stage;† here cellulitis of the broad ligament is still confused with abscess of the iliac fossæ of every other origin. Nonat, Valleix, and their disciples‡ took a step forward in the clinical recognition of peri-uterine inflammations, by describing the more limited collections of pus which occur behind and on the sides of the uterus; these authors localise them in the cellular tissue which, according to them, would exist not only between the layers of the broad ligament, but also around the supra-vaginal portion of the cervix, and particularly behind it, just like a signet ring, the stone of which would be directed towards Douglas' pouch, to use a comparison instituted by Gallard.

Interminable discussions, more theoretical than practical, now arose about the question; at the same time another interpretation of the same facts had just been brought forward. Bernutz and Goupil,§ after a remarkable description of the clinical phenomena

* Grisolle. Arch. gen. de méd., 1839, 3rd series, vol. 4, p. 39 and foll.—H. Bourdon. Revue méd., 1841, vol. 3, p. 5 and foll.

† It is unnecessary to do more than mention the earlier theories. Mauriceau attributed all post-puerperal tumours to retention of the lochia; Puzos believed in a metastasis of the milk, and his opinion, supported till the commencement of this century by Ritgen, A. E. Siebold, Busch, &c., has left very definite traces in popular prejudice.

‡ Nonat. Gaz. des Hôp., 1850, pp. 97, 110, and 129.—E. Martin. Thesis, Paris, 1851. —Valleix. On inflammation of the peri-uterine cellular tissue (Union méd., 1853, 5th series, vol. 9, pp. 285 and 419).—Gallard. On inflammation of the cellular tissue that surrounds the womb. Thesis, Paris, 1850.

§ G. Burnutz and E. Goupil. Arch. gén. de méd., 1857, 5th series, vol. 9, p. 419, and A clinical treatise on the diseases of women, Paris, 1862, vol. 2, p. 7.

that we now associate with circumscribed or diffuse inflammation of the tubes, had attributed them, without exception, to inflammation of the pelvic peritoneum or pelvic peritonitis.*

Some eclectic writers, such as Matthews Duncan and Simpson,† admitted both the foregoing modes of origin. Virchow‡ coined the words "perimetritis" and "parametritis" to distinguish inflammation of the peritoneal covering from that of the peri-uterine cellular tissue.

A fresh interpretation of a series of closely analogous, if not identical, facts now appeared to further add to the confusion of the nosology.

The part played by the lymphatics in peri-uterine inflammations after delivery had been recognised by many authorities. J. L. Championnière§ attributed to them still greater importance, and extended their influence from the uterus in the puerperal condition to the unimpregnated uterus.

Alph. Guérin‖ believed that he had discovered a new clinical

* By the term "peri-metro-salpingitis" it is my desire to expressly indicate that these forms of inflammation are, without exception, secondary to lesions of the uterus or of the appendages. The term "pelvic peritonitis," on the contrary, that Bernutz and Goupil's works had rendered classical in France, leaves this point doubtful, and even seems to indicate that the primary lesion is an inflammation of the peritoneum; and this is the reason why I cannot understand the attempt at rehabilitation made by P. Reclus. Semaine méd., 1891, No. 35, p. 282.

† Matthews Duncan. A practical treatise on perimetritis and parametritis. Edinburgh, 1869.—J. Y. Simpson. On pelvic cellulitis and pelvic peritonitis in Clinical Lectures on the diseases of women (edited by A. R. Simpson), Edinburgh, 1872.

‡ Virchow, cited by P. Delbet. On pelvic suppuration in women. Paris, 1891, p. 153.—Many writers still attribute these terms to Duncan.

§ J. L. Championnière, Thesis, Paris, 1870.

‖ Alph. Guérin. Clinical lectures on the diseases of the female internal generative organs (11th lecture), Paris, 1878.—In a communication to the Academy of medicine (Bull. de l'Acad., May 11, 1887, p. 533), Alph. Guérin categorically denies the existence of cellulitis of the broad ligament, which he regards as unrecognised juxta-pubic adeno-cellulitis. He bases this assertion on anatomical considerations. According to him, the broad ligament is formed by two aponeuroses placed edgewise, and one aponeurosis placed on the flat, at their base. A true closed cavity would thus be formed, and the pus could not possibly spread beyond it and involve the neighbouring cellular tissue, as is nevertheless clinically the case. Consequently, according to the eminent academician, the old localisation was wrong. Adeno-cellulitis would then be the result of a lymphangitis occurring in the network of lymphatics running from the cervix uteri into the glands situated near the sub-pubic notch. This would be a true inflammatory bubo, and the wide connections of the cellular tissue that surrounds it with that which lines the abdominal wall would easily explain the inflammatory "plastron." Unfortunately, this seductive theory is open to criticism from the point of view of the anatomical facts upon which it is based. The new conception of the broad ligament as a closed cavity enveloped by the peritoneum in "the same way as it envelops the stomach or the intestine" is still to be proved The dried

variety and a different localisation of the inflammation around the uterus; he described it under the name of "juxta-pubic adeno-cellulitis." The starting-point, he held, was a retro-pubic or obturator lymphatic gland or afferent vessels spread beneath the peritoneum and around the uterus. Whenever so-called cellulitis of the broad ligament extended to the cellular tissue of the abdominal wall, according to Guérin, it would be a case of juxta-pubic adeno-cellulitis. Further, Guérin, L. Championnière, Guéneau de Mussy, Siredey, and Martineau admitted the existence of "adeno-lymphitis," to explain the more circumscribed peri- and para-metritic inflammations.

Henceforth the lymphatic interpretation held the ground, and a part was no longer ascribed either to cellular tissue or to peritoneum. According to this theory, moreover, as according to those previously mentioned, the inflammation started from the mucous coat of the uterus, and the initial metritis therefore absorbed the practitioner's whole attention.*

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specimens of Jarjavay that have been adduced in support of the view cannot be regarded as a sufficient proof, for in such preparations the natural arrangement of the parts may be artificially, although unconsciously, disturbed. With regard to the sub-pubic gland (pointed out by Cruveilhier), it does not receive the cervical lymphatics. Sappey (Bull. Acad. de méd., May 18, 1887) asserts, on the other hand, that the uterine lymphatics run in the following directions: those of the muscular tissue into the glands situated at the level of the angle of bifurcation of the common iliac (vessels of the anterior surface of the uterus which first of all course along the edges of the broad ligament); those of the posterior surface into the pelvic glands, situated behind the common iliac, and those of the upper border into the lumbar glands. The lymphatics of the mucous membrane, according to Sappey, run sometimes into a small inconstant gland, near to the insertion of the vagina into the cervix. The learned anatomist does not hesitate to affirm that a dried specimen, deposited in the Clamart museum, which A. Guérin adduced in support of his theory, is of artificial formation, and cannot be trusted.

If suppuration of the broad ligament exists, is it due to lymphangitis? Guéneau de Mussy first advanced this view, which was supported by J. L. Championnière, who even asserted that this ligament often contained lymphatic glands; but this is not the case. The same writer has described them around the utero-ovarian vessels, but neither Auger nor Poirier have succeeded in finding them. (G. Auger. On peri-uterine lymphadenitis. Thesis, Paris, 1876.—Fiouppe. Uterine lymphatics, &c., Thesis, Paris, 1876.) But it is indisputable that large lymphatic trunks run through the ligaments and can serve to convey the inflammation. Poirier has recently given a good description of them in Cantin's thesis, On non-puerperal peri-uterine lymphangitis. Thesis, Paris, 1889.—Cf. also P. Poirier. Progrès méd., 1889, Nos. 47 to 51; 1890, Nos. 2 and 4.

* In connection with this question, the names of Gosselin, Doherty, Churchill, Lever, Bennett, Kiwish, Scanzoni, and the more recent names of Olshausen, Spiegelberg, W. A. Freund, Monprofit, Routier, Poirier, &c., may also be mentioned; but here I am not giving a complete history, but only a short sketch of the various views.

At the very commencement of the contradictory discussions that divided the majority of gynæcologists into separate camps, a theory had been timidly put forward, and for lack of sufficient demonstration had not received the attention it merited. Aran,* who first clearly saw the extreme importance of the ovary and tube in uterine pathology, took a step in front of the age, by frankly subordinating pelvic peritonitis to inflammation of the uterine appendages. He clearly pointed out that it is they which always form the focus around which pus and plastic material collect. Some isolated observations† tending to support this proposition were published, but were passed over unnoticed.

At the present time the tendency is to revert to Aran's theory, but it seems to me, without affirming with sufficient decision, that it alone can and ought to explain almost all kinds of peri-uterine inflammation. The most recent writers‡ still keep a separate description for parametritis and perimetritis, and sometimes add to them another one for adeno-lymphitis, and the embarrassed reader does not recognise himself in the midst of the subtleties of an illusory diagnosis. Personally, I wholly agree with Aran. The facts I have seen convince me that the large majority of peri- and para-metritic inflammations are nothing more than salpingitis and perisalpingitis.§ The lymphatics no doubt play an important part, but this part is itself subordinate to the anterior inflammation of the mucous coat of the uterus and its extension into the Fallopian tubes. And certainly it is the primordial phenomenon that ought by rights to give the name to a disease.

Pathological anatomy.—I shall describe in succession the various anatomical forms that may be taken on by inflammation around the uterus and its appendages, commencing with the slighter varieties and proceeding by steps to those that are more serious. These clinical types are: 1. Serous peri-metro-salpingitis. 2. Pelvic abscess. 3. Cellulitis of the broad ligament. 4. Diffuse pelvic cellulitis.

* Aran. Clin. Lect., p. 667.

† M. Bouveret. Ann. de Gyn., 1875, vol. 4, p. 427.—C. Darolles, ibid., vol. 6, p. 419.

‡ A. Martin. Clinical treatise on the diseases of women, French transl., Paris, 1889.

§ Cf. on this subject J. W. Taylor. Clinical lecture on pyo-salpinx, with remarks on the old faith and the new, regarding parametritis (Lancet, 1889, vol. 2, p. 581).

I. *Serous peri-metro-salpingitis.*—This condition cannot be observed on the dead body, but it may be seen very distinctly during the course of certain operations. Personally, I have on two separate occasions found an œdematous infiltration of the expansion of the broad ligament around a tube affected with purulent salpingitis. Before opening the abdomen, and by bi-manual examination, this infiltration yielded the sensation of a fairly large tumour, which was erroneously attributed to the tube itself. Lymphangitis undoubtedly plays an important part in the production of this œdema with its secondary inflammatory foci.

This is proved by the swelling of the inguinal glands that is

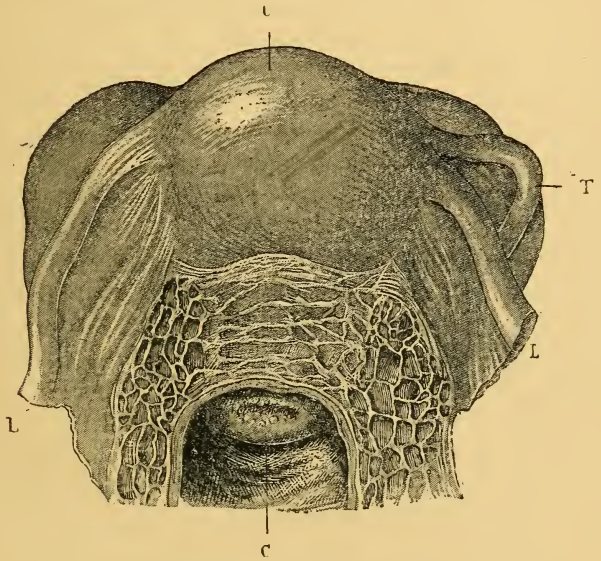

Fig. 329.—Serous peri-metro-salpingitis (inflammatory œdema).
C, cervix uteri seen through an opening in the anterior wall of the vagina.

sometimes seen ; these glands communicate with the superficial lymphatics of the uterus by a small vessel that accompanies the round ligament (fig. 313, 9).

Brawny œdema may, no doubt, invade the loose cellular tissue that surrounds the Fallopian tube, under the influence of an acute exacerbation of the salpingitis upon which it depends. It is probable also that a small quantity of muco-pus or of blood coming from the inflamed mucous membrane may from time to time irritate Douglas' pouch, into which the appendages are so

frequently prolapsed (L. Tait). Be that as it may, the existence of intermittent inflammatory œdema around the diseased appendages cannot be controverted. Direct observation has demonstrated it, and according to de Sinéty, induction allows of our assuming its presence in cases in which large masses on the sides of the uterus appear and disappear in a few days, as has been recognised by every practitioner. In exactly the same way, a carious tooth may lead to a large swelling of the cheek, which, after 48 hours, often completely disappears.* Side by side with this serous perisalpingitis must be placed serous perimetritis. There are some cases, in point of fact, in which the inflammatory œdema occurs at the base of the broad ligament around the large lymphatic trunks that come from the cervix uteri (fig. 314). This is especially likely to occur after certain operations on this part (Schröder's operation, Emmet's operation, &c.), when sufficient antiseptic precautions have not been taken.

To this inflammatory œdema of the sub-peritoneal connective tissue, anatomically comparable to the experimental œdema induced by Ranvier's method, is sometimes added a secretion of serum between the meshes of the adhesions around the appendages, and in particular in Douglas' pouch, forming collections of serum. Puncture with a fine trocar under these circumstances, often performed for therapeutic ends, has often placed their existence beyond doubt and established their frequency. Moreover, they have often been found during certain cases of laparotomy. Alban Doran† has published a curious case in which a serous collection of this nature was taken, after the belly had been opened, for a sarcoma of the ovary beyond the power of removal; the rapid disappearance of the tumour removed all doubt of its nature.‡

Such is the first degree of inflammation occurring around the uterus and its appendages; it corresponds in the immense majority

* De Sinéty. Pract. treat. on gyn., 2nd ed., Paris, 1884, p. 817.—Inflammation occurring in the neighbourhood of the uterus, with especial consideration of the benign forms. (Prog. méd., 1882, pp. 591 and 611.)

† Alban Doran. Anterior serous perimetritis simulating ovarian sarcoma when explored by abdominal section. Recovery with disappearance of the cyst. (Trans. of the Obst. Soc., London, 1889, vol. 31, p. 217, and ibid., May 6, 1891.)

‡ These collections of serum may suppurate and then form adventitious sacs around the diseased appendages, in which the latter are sometimes completely hidden. These are the lesions which have been described since Bernutz's time under the name of "pelvic peritonitis."

of cases to a very definite clinical variety, that characterised by ephemeral exacerbations in inflammation of the tubes. And no doubt it is to it that is related the circumscribed and undiagnosed parametritis which is called in to explain relaxation or contraction of the uterine ligaments (Schultze).

Suppurative peri-metro-salpingitis presents two very different clinical varieties. One corresponds to the ultimate phases of the pelvic peritonitis of some writers, just as salpingitis and pyo-salpinx correspond to the earlier phases; it is pelvic abscess. The other, cellulitis of the broad ligaments, is characterised by a peculiar mode of extension of the suppuration determined by certain ætiological circumstances.

II. *Pelvic abscess.*—This term must no longer be used in a comprehensive sense, as it was till quite recently. In point of fact, cases of large pyo-salpinx forming vast abscesses adherent by a large portion of their confining wall to the true pelvis, have long been regarded as encysted collections of pus arising from pelvic peritonitis or for abscesses developed beneath the layer of peritoneum, and have wrongly been called "pelvic abscesses."* Their real origin, it is true, is difficult to demonstrate, and requires a decortication of the tubal sac such as the early operators who went in search of pus in the abdomen would not have dared to undertake, even if they had believed it possible. When one finds oneself, after opening the belly, face to face with a sac as large as or larger than the two fists, circumscribed on all sides by adhesions, and seeming behind to be part and parcel of Douglas' pouch, which it fills, bound down laterally to the pelvis and above to the omentum or even the intestine, it is very natural to think that one has to do with an abscess formed either in the sub-peritoneal tissue (parametritis) or in the peritoneal cavity, and shut off by false membranes (pelvic peritonitis); nevertheless in the vast majority of cases it is a purulent tubal cyst, which, at first free, has become bound down by adhesions secondarily. And this fact can be ascertained by boldly shelling out the sac (which it is advisable to first empty by aspiration). When this work, which is often very difficult, has been done, one finds a cyst provided with a pedicle on its

* I have taken for my description of pelvic abscess the most common variety as a type. But I do not fail to recognise the other origins of collections of pus in the true pelvis, as I have wrongly been supposed to do. (Reclus, *loc. cit.*)

inner side which is attached to the cornu of the uterus, and one immediately recognises that one has to deal with a dilated Fallopian tube.

The majority of the so-called "pelvic abscesses" that were treated by laparotomy and incision without any attempt at complete extirpation by Lawson Tait, Hegar, Terrillon, &c., a few years ago were therefore neither more nor less than cases of adherent pyo-salpinx, the only treatment for which should be complete extirpation.* Their clinical history and method of treatment by operation belongs to the chapter on pyo-salpinx, to which I refer the reader.

There remains, however, among these encysted collections of pus a certain number of cases in which the attachments to the neighbouring parts are so close that complete removal is impossible or too dangerous. These cases may with justice be differentiated under a special name, and they may be termed "pelvic abscesses" with the qualification that the name is reserved to non-enucleable collections of pus. The term, therefore, has a surgical rather than an anatomical value. As a matter of fact, at the autopsy in these advanced cases it is generally impossible to make out the nature of the wall of the abscess, whether it is thickened peritoneum, false membrane, or the wall of a dilated Fallopian tube. †

For the same reason we must class amongst pelvic abscesses certain cysts enclosed in the broad ligament and certain

* Such is particularly the case with the observations published by O. Terrillon. Opening of intra-peritoneal and deep abscesses of the pelvis by laparotomy. (Bull. et Mém. de la Soc. de Chir., 1887, p. 367.)

† Many examples will be found of this difficulty in interpreting specimens. Alph. Guérin (Clin. lectures on the diseases of the female internal generative organs, Paris, 1878, p. 358) relates that he was once present at the autopsy of one of Nonat's patient's who died of an affection that Nonat called peri-uterine cellulitis, whereas he himself showed that the case was one of pelvic peritonitis. This fact proves to his mind that "pelvic peritonitis is rather the disease that Nonat has referred to inflammation of the peri-uterine cellular tissue." But Guérin here passes over in silence the condition of the ovaries and tubes.—Goudeau and Moulonguet (Bull. de la Soc. anat., April 27, 1887) have shown a characteristic specimen from this point of view. It was a case of pyo-salpinx coming on in the absence of the puerperal state, and having given rise to all the classical symptoms of Bernutz's pelvic peritonitis. At the autopsy the pelvis was found to be filled with a large mass reaching nearly up to the umbilicus and covered by the intestines that were closely adherent to it. The uterus was jambed to the left by a fluctuating tumour, the size of the two fists, full of pus, and bounded by thick walls. It was composed of two intercommunicating sacs. It was attached to the uterus, and seemed to have been developed at the expense of the right ovary and tube, no traces of which could be found.

hæmatoceles which, having suppurated and become converted into abscesses, have become adherent on all sides and are inseparable from the soft or hard portions of the pelvis. Amongst the cases of pelvic abscess that Lawson Tait* publishes as cured by laparotomy and incision is one that he refers to an extra-peritoneal intra-ligamentous gestation. No vestige of a fœtus was found in the pus, but only shreds of placenta.

Therefore, if cases of excessively adherent pyo-salpinx constitute the vast majority of pelvic abscesses, pelvic abscesses have exceptionally another origin.

In certain cases, moreover, the diseased appendages, though of inconsiderable size, are the starting-point of a large pelvic abscess, the walls of which are formed by adhesions and agglutinated coils of intestine. It is in these cases that an attempt has been made to attribute the chief part of the disease to inflammation of the peritoneum, and to call the disease pelvic peritonitis, without paying sufficient attention to the initial oophoro-salpingitis.

Lastly, I have exceptionally seen collections of pus at some little distance from a pyo-salpinx, and developed in all probability around lymphatic vessels infected at a distance by the utero-tubal lesion; but one can always demonstrate the existence of this primary lesion. †

The close adhesion of a pyo-salpinx to the walls of the pelvis, or to the organs contained in the pelvis, is a first step towards its spontaneous opening. This is particularly likely to occur into the rectum; after an evacuation that has for the time being relieved the tension in the sac, a second evacuation occurs, and soon the communication between the sac and the intestine becomes, if not permanent, at any rate regularly intermittent. These fistulæ also open into the vaginal cul-de-sac, though more

* L. Tait. Pathological importance of the broad ligaments. (Edinb. Med. Journ., August, 1889, vol. 35, p. 97.

† In other words, even if there be pelvic peritonitis, or lymphangitis, or cellulitis, without fail in those complex lesions that give rise to pelvic abscess, the fact must be recognised that they are only secondary phenomena; consequently, I have thought fit to relegate them to the second place from a nosological point of view, and to give the disease the more comprehensive name of "peri-metro-salpingitis," a name which will be a guidance to the practitioner and the operator at the same time. Pelvic abscess, which constitutes a "species" of this "genus," is specially due to peri-oophoro-salpingitis, while cellulitis of the broad ligament, another "species" of pelvic suppuration, is as a rule secondary to a uterine infection, or perimetritis.

rarely. Lastly, if the abscess has formed a short time after parturition, when the appendages, raised by the hypertrophy of the gravid uterus, have a tendency to be directed forwards, the suppuration may break into the anterior portion of the true pelvis, and after having spread over the pre-vesical cavity of Retzius may burrow in the direction of the groin or the umbilicus.*

These fistulous pelvic abscesses form one of the most important varieties. When they have been in existence for some considerable length of time, they become contracted down into narrow and very sinuous passages, seated in the midst of a chronically indurated tissue, the treatment of which is extremely difficult.†

Klob‡ has pointed out the frequency of the occurrence of fatty degeneration in the neighbourhood of pelvic suppuration. I have myself also noticed it; it is particularly appreciable when one attempts to peel off a sac adhering to the organ, which then tears very easily.

Hardened masses formed by infiltration and proliferation of the connective tissue often exist at the edges of pelvic abscesses, and extend for a greater or less distance from them. They may remain after the abscess has been evacuated, and then are absorbed very slowly. The omentum may also contain hard

* Bernutz (Arch. de tocol., 1874, vol. 1, p. 486) relates two cases of peri-uterine suppuration discharging at the umbilicus. The patients died.—A. Guérin (*loc. cit.*, p. 283) relates a case in which an umbilical fistula persisted for a long time, and closed after another pregnancy. The latter case seems to have been one of cellulitis of the broad ligament, which came on a few days after delivery.

† Trélat (Bull. et Mém. de la Soc. de chir., Dec. 26, 1888, p. 1035) has very clearly defined them under the name of "complex cases related more or less directly to old salpingitis, or old pelvic peritonitis." He proposes for them the name of "pelvic cellulitis," which I personally reserve for another species.—Wiedow (Third Congress of German gynæcologists, Friburg, 1889, in Centr. f. Gyn., 1889, No. 30, p. 520) also makes a special class of fistulous abscesses.

The opening of pyo-salpinx and of pelvic abscess into the bladder has also been asserted. I do not think that Aug. Reverdin's case (Bull. et Mém. de la Soc. de chir., 1888, p. 1016) is conclusive. The vesical lesion might have been made by the trocar, and not by a spontaneous perforation. Mundé's observations (Amer. Journ. of Obst., Feb. 1886, p. 113 and foll.) show how easily this viscus may be wounded. With regard to the discharge of pelvic suppurations into the sigmoid flexure, and at Petit's triangle in the lumbar region, I think it refers to abscesses in the iliac fossa, dependent upon peri-typhlitis, or to peri-nephritic abscesses, and not to suppuration coming from the generative organs. Mistakes have often been made on this subject.

‡ Klob. Wien. med. Woch., 1862, Nos. 48 and 49, and Path. Anat. der weibl. Sexualorgane, 1868.

masses dependent upon chronic inflammation. As a rule, all these lesions disappear very quickly after the seat of pus-formation has been removed.

III. *Cellulitis of the broad ligament* is almost always secondary to a recent delivery. When the cellular tissue of this fold of serous membrane has been distended and relaxed, and its veins become varicose, or become thrombosed, or even present ruptures that have allowed the blood to be extravasated to a greater or less extent, we have here an anatomical condition that is extremely likely to favour wholesale and rapid invasion of the suppurative process. But what is its precise starting-point? Does infection take place through the inflamed Fallopian tubes that occupy the upper edge of the broad ligament, or by a peri-lymphangitis of the large vessels that run in it? Both modes are equally probable, and may, moreover, co-exist; but the points that it is important not to lose sight of are the preliminary anatomical condition and the intensity of the infection, which allow the lesion from the outset to take on a special character, that of a cellulitis with a tendency to wide diffusion, and very different from that of a circumscribed abscess.*

Gynæcology does not possess much reliable anatomical information on this condition. In the account of an autopsy published by Lewers,† we find mentioned some interesting facts. The two layers of peritoneum were separated by an abundant exudation that started from the lower edge of the tube and extended to the base of the ligament below, and to the pelvic wall behind. The tube was stretched beneath the convex surface of this swelling; the writer gives no information concerning its anatomical condition, which he does not seem to have inquired into, but he expressly mentions a small abscess in the ovarian tissue, and says that its surface was fixed by recent adhesions to the surface of the broad ligament. It is therefore extremely probable that the tube was diseased, and in any case the broad ligament might

* P. Delbet (Pelvic suppuration in women, Paris, 1891, p. 152 and foll.) divides cellulitis of the broad ligament into cellulitis of the hypogastric sheath and cellulitis of the broad ligament, properly so called. The first, which is the most common, has its seat in the cellular tissue traversed by the intra-pelvic branches of the internal iliac, and by the cervical and upper vaginal lymphatics. The second, which is rarer, has its seat in the region of the broad ligament traversed by the utero-ovarian artery, and by the lymphatics of the fundus uteri, the tube, and the ovary.

† Arthur H. Lewers. Note on the post-mortem appearances of the broad ligament (Trans. Obst. Soc., Lond., 1888, vol. 30, p. 7).

have been infected by the suppurating ovary. A section of the broad ligament showed an areolar tissue like that of a large sponge, the interstices of which were filled by a sero-sanguinolent liquid. In an autopsy at which Carter * was present, a section of the broad ligament suggested the idea of an interstitial injection of plastic material separating the normal elements from one another, keeping the veins distended and the lymphatics fixed and widely open. Lastly, Delbet † has published the account of the autopsy on a woman who had been delivered three weeks previously, and in whom he found at the base of each broad ligament a cavity containing about 100 grammes of pus, traversed by thick cords, which were formed from obliterated arteries and veins. An injection forced into the hypogastric artery showed that these vessels were the visceral branches of the internal iliac.

The inflammatory infiltration readily extends backwards beneath the peritoneum, along the psoas and iliacus, as far as the anterior superior spine of the ilium, and there it involves the subcutaneous layer of fat by passing through the weak points in the musculo-aponeurotic layer formed by the entrance and exit points of vessels and nerves. As soon as the purulent sac has come into contact with the abdominal wall, it becomes adherent thereto, and in consequence gives rise to a sensation of a firm flattened mass or plastron.‡ As a rule suppuration follows upon the infiltration, but not always; in that case the process stops short and the cellulitis resolves, leaving behind only some indurated masses of cellular tissue. Under these circumstances I have noticed a phenomenon that is curious and but little known; which, moreover, lasts for some considerable time after all symptoms of peri-uterine inflammation seem to have subsided. When the whole disease has seemed to have come to an end, one may observe signs of inflammation starting at a greater or lesser distance from its original focus, in the iliac fossa, in the sheath of the psoas muscle, or even in the peri-nephritic cellular tissue.

* Carter, ibid., p. 9.

† P. Delbet, *loc. cit.*, p. 156 and foll.

‡ O. Terrillon (Arch. de tocol., 1889, p. 170) has shown by conclusive cases that an abdominal plastron is formed when the inflamed appendages come into contact with the abdominal wall. Contact, moreover, need not necessarily be immediate, but may be indirect through the mediation of inflammatory peripheral masses in the omentum.—This fact had been already pointed out by Polk. Amer. Journ. of Obst., 1887, vol. 20, p. 631.

It seems as if there must have remained here traces or residues of septic material that develop but slowly after having lost all connection with their first starting-point. It is probable that the lymphatics play a very important part in the formation of these slowly-forming abscesses, which are similar to those occurring in regions where, a few days previous to their appearance, there have been symptoms of lymphangitis.

IV. *Diffuse pelvic cellulitis.*—In all the preceding cases the septic infection was more or less localised, and ended in the formation of lesions restrained within certain limits. But this is not always the case; after certain kinds of puerperal poisoning the infiltration extends rapidly to all the pelvic cellular tissue just as if it were a malignant erysipelas, and hence the name of "erysipelas malignum puerperale" given to it by Virchow.* The œdematous tissues are of a livid colour, the lymphatics are full of micrococci, and the veins contain thrombi or pus; these cases are almost certainly fatal. The part played here by the lymphatics does not admit of question; we are face to face with a true septic lymphangitis, starting from the raw surface in the uterus and embracing all the parts that surround the genital apparatus. It is to this clinical type that I propose to reserve the name of diffuse pelvic cellulitis.†

General ætiology.—I shall not revert to what has already been said relative to the ætiology of inflammation of the tubes, and which applies here also very exactly, since, with the exception of diffuse pelvic cellulitis, which constitutes a class by itself, all or almost all cases of peri-uterine inflammation are neither more nor less than an extension of disease having its centre in the ovary or tube. I shall simply point out the special ætiological circumstances belonging to the various categories that I have distinguished.

Foci of inflammatory œdema occur in the course of all the acute and chronic varieties of inflammation of the tubes.‡

* Virchow. Arch. f. Path. Anat., 1862, vol. 23, p. 415.

† Alex. J. C. Skene (Pelvic cellulitis, in The Brooklyn Med. Journ., Jan., 1889, vol. 3, p. 1), like many other writers, confounds under the name of pelvic cellulitis what I speak of as pelvic abscess, and as diffuse pelvic cellulitis.

‡ The initial salpingitis that is the starting-point of these symptoms has hitherto been generally unrecognised. Of this I need no better proof than the excellent clinical table drawn up by de Sinéty (*loc. cit.*, p. 815), in which, under the name of "circum-uterine inflammation properly so called," he gives an admirable description of the symptoms of catarrhal salpingitis, including the tubal pains which, after

Pelvic abscesses follow upon pyo-salpinx, upon suppuration of a cyst enclosed in the ovary, or upon a pelvic hæmatocele situated in the neighbourhood of an inflamed tube. Their formation is favoured by excessive temporising, or by too prolonged or too violent examinations.

Is cellulitis of the broad ligament. seen apart from the puerperal state, the predisposing influence which I have endeavoured to bring into the foreground? Bernutz admits that of twenty cases seventeen will depend upon the puerperal condition. Frarier,* in a work which gained much notice, asserted that cellulitis of the broad ligament was never seen apart from this single cause. Delbet† holds the opinion that cellulitis of the broad ligament is seen much more frequently in the absence of, than during the puerperal state. These two views are too exclusive. No doubt infection of the uterus by septic operations seems to have led to the same sequelæ as parturition; but these cases are rare, and they always indicate the existence of an infection due to neglect of the rules that at the present time influence surgery. These pathogenic conditions are especially seen to occur, and far too frequently so, after certain deliveries or abortions; hence it follows that the puerperal state is the most common cause of cellulitis of the broad ligament.

Lastly, *diffuse pelvic cellulitis* may supervene upon the same conditions, viz., delivery or any operation on the generative tract, carried out under exceptionally septic circumstances; it is quite comparable to the cellulitis that used formerly to be seen after serious operations on the bladder or rectum.

Symptoms and diagnosis. I. *Serous peri-metro-salpingitis.*—The signs of inflammation extending around the tubes and uterus, in its most benignant form, are those which I have shortly described in the chapter on salpingitis under the name of "exacerbations." They have been well described by many writers, though under different names. Peter‡ and Guéneau de Mussy§ have mentioned them without specifying their exact

having carefully noted them, he refers "to the constipation that is so common in these conditions, and to the presence of gas in the intestine."

* Frarier. Consideration of cellulitis of the broad ligament. Thesis, Paris, 1866.

† Delbet, *loc. cit.*, p. 204.

‡ Peter. Notes on Bennett's translation. Pract. treatise on inflammation of the uterus, p. 259.

§ Guéneau de Mussy. Clin. méd., vol. 1, p. 474.

localisation. Martineau * refers them to peri-uterine adenitis. Courty † also admits their lymphangitic origin. Mundé in America, and A. Martin in Germany, also accept the view; while Cantin ‡ has devoted a good work to the defence of the same opinion.

Beyond the signs of the concomitant salpingitis the following are those arising from the surrounding inflammation itself. The patients complain of a recrudescence of their habitual malaise; it is rare, however, for there to be any marked rise of temperature, and slight gastric disturbance alone may be present. On digital examination increased tenderness is found in the cul-de-sac; sometimes even a very sharp and very localised pain causes the patient to cry out each time the finger comes to some particular spot. There may be general thickening of the parts, and especially if there have already been similar or more serious attacks which have rendered the uterus completely immobile from adhesions. In these cases the signs found on digital examination, at the time of a simple exacerbation of this nature, may take on so apparently serious a nature as to mislead an inexperienced practitioner. The absence, however, of severe constitutional symptoms will prevent an exaggerated prognosis from being formed.

After a few days, in point of fact, this general thickening will begin to disappear, and will give place to swellings independent of the uterus, which has often now become quite mobile. As a rule there are several hard foci in the posterior and lateral culs-de-sac. They feel, as Guéneau de Mussy first pointed out, like rounded lymphatic glands more or less tender on palpation.§ The changes that these swellings undergo are very rapid, so much so that if the result of the daily examinations have not been carefully written down, one would almost believe that one had been the victim of an illusion (de Sinéty).

Sometimes certain very hard wood-like nodules may remain for

* Martineau. Clin. lect. on Dis. of the uterus. Paris, 1880, p. 779.

† Courty. Annal. de Gyn., 1881, vol. 15, p. 242.

‡ Cantin. On non-puerperal peri-uterine lymphangitis. Thesis, Paris, 1889.

§ Martineau (Clin. lect. on dis. of the uterus, p. 779), guided by the theoretical ideas which dominated his nosology, asserted that he could clearly recognise by touch the lines formed by the diseased lymphatic vessels as hard and resistant cords, and described the characters of the adeno-lymphitis corresponding to the nature of the uterine affection. In scrofulous metritis the glands would be large, painless, and numerous. In arthritic metritis they would be small, multiple, &c.

a very long time, and their consistency and shape may more or less cause them to resemble fibromata (Guéneau de Mussy). They may easily be distinguished therefrom by the lack of intimate connection with the uterus, and by the absence of any dilatation of the uterine cavity. A prolapsed ovary is larger and forms an isolated swelling, pressure on which leads to a peculiar nauseating pain that may lead to syncope. The tumour formed by a small ovarian cyst, or a cyst of the broad ligament, has quite different characteristics; it is elastic or fluctuating, definitely lateral in position, single, and accessible only by bimanual palpation, and not by digital examination alone. I simply mention scybala, which could only deceive a careless observer who neglected a rectal examination.

Examination by the speculum gives no information at all.

The progress of these nodules of œdema and collections of serum, in peri-salpingitis, is capricious and irregular; they constitute one of the elements of those repeated attacks of inflammation of the appendages that have been described in the chapter upon salpingitis; they are extremely likely to recur, but have no tendency to end in suppuration.

II. *Pelvic abscess.*—This name does not simply designate collections of pus situated in the true pelvis, for then all cases of pyo-salpinx would be included under it. What surgically characterises pelvic abscess is that it is a collection of pus which is not free and independent, not capable of enucleation or removal with the formation of a pedicle, but rather a pelvi-parietal collection, bound down to the pelvis, which forms a portion of its wall. It has been described under both the names of "pelvic peritonitis" and "suppurative parametritis"; cellulitis of the broad ligament, which constitutes a very distinct clinical variety, has also wrongly been included under the name of pelvic abscess.

Clinically, pelvic abscess is, as a rule, only an advanced stage in the history of a pyo-salpinx, and there is no demarcation between them from a symptomatic point of view. Sometimes, however, acute symptoms mark the conversion of the circumscribed variety of suppuration of the tubes and ovaries (pyo-salpinx, abscess of the ovary) into the diffuse variety. If pus exude into the peritoneal lining of the pelvis, or simply if there be a sharp attack of inflammation around the sac, there may

appear sudden sharp pain, producing faintness and accompanied by symptoms similar to those of peritonitis, viz., rigors, vomiting, tympanites, contracted features, and a thready pulse. At the same time the temperature, which till then may have been normal, or only so slightly raised as to require very careful use of the thermometer to discover it, rises rapidly, and probably takes on a hectic type with morning remissions. Neighbouring parts, such as the rectum and bladder, also share in the derangement, and constipation, dysuria, rectal and vesical tenesmus, are common. If the abscess project towards the rectum there may be complete obstruction.*

Digital and bimanual examination must be carried out with the greatest care. They prove that the uterus is fixed in the pelvis and as if imprisoned in a stream of plastic material, which is neither more nor less than the intense inflammatory œdema that has infiltrated the whole of the neighbouring cellular tissue. At the end of a few days this œdema diminishes, and exposes the prominence of the abscess, which is then separated from the cervix by a more easily depressible furrow. This abscess tumour is smooth, regular, and difficult to limit above; it gives a sensation of warmth to the finger, and arterial pulsation due to dilatation of the vessels is often felt in it; fluctuation is only rarely obtained, on account of the indurated condition of the vagina, which is sometimes of cardboard consistency, and of the great thickness of the infiltrated tissues that separate the pus, which is often present in very small quantity in spite of the large amount of induration that surrounds it, from the finger.

An important characteristic is the immobility of the uterus and of the tumour; both seem to be solid and bound down. By bimanual examination also one can find out that the tumour adheres to the pelvic wall. The uterus is retroverted and the cervix is jambed up against the pubes, if, as is most common,

* A curious epi-phenomenon of pelvic suppuration is the production of diaphragmatic pleurisy, which is fairly common. Potain (French assoc. for the advancement of the sciences, Rouen, 1883) showed that simple ovarian or peri-ovarian congestion, or irritation, may, by a kind of *contre-coup* (reflex nervous action) react upon the pleuræ.—A. Lasne (Diaphragmatic pleurisy and pelvic peritonitis. Thesis, Paris, 1887) has taken up the subject again, and admits that the pleurisy is then due to the extension of the inflammation from the pelvic to the diaphragmatic peritoneum by lymphatic vessels, and more particularly by those which accompany the tubo-ovarian vessels and end at the rura of the diaphragm. As a rule, the diaphragmatic pleurisy is dry and very slight

the tumour is seated in the posterior cul-de-sac; it may also be especially prominent at the sides, or lastly, and much more rarely, the chief portion of the induration may be in front, between the uterus and the bladder.

A rectal examination gives further valuable information upon the connections of the tumour. The speculum is quite useless.

A fairly definite period of remission may now occur and last for some little time, in consequence of the formation of protective adhesions that fix a boundary to the focus of inflammation. But when the tendency to evacuation becomes again pronounced, the lancinating pain and the fever become redoubled. If the pus tend to find an exit towards the posterior cul-de-sac, the vagina first gives evidence of induration, but if it be towards the rectum the symptoms are a feeling of weight in the perinæum and most painful rectal tenesmus.

An extremely severe attack often precedes the bursting of the abscess into the rectum, the vagina, or more rarely the pre-vesical cellular tissue; a sudden period of relief follows thereupon, but is not of long duration. The abscess does not discharge itself properly, and then symptoms of chronic absorption of pus manifest themselves, or else it is completely evacuated, but refills, and afterwards becomes emptied at irregular periods with the same train of accompanying general symptoms on each occasion. The patient falls into a hectic and enfeebled condition, similar to that which I described when dealing with fistulous pyo-salpinx. And indeed at this time the two conditions are clinically quite indistinguishable, and the difference that results from the connections of the focus of inflammation (enucleable in the one case, and not enucleable in the other) can only be made out after an exploratory incision. In some exceptional cases the patient recovers when the pus has been discharged, but even then the abscess often leaves behind an interminable fistula. Some cases of very rapid death after bursting of the abscess into the peritoneum have been published, but they are very rare in consequence of the formation of false membranes that tend to circumscribe the inflammation.

A pelvic abscess may be tubercular, like the pyo-salpinx from which it is derived; in these cases, as a rule, other signs of tuberculosis are to be found in the lungs.

The diagnosis of pelvic abscess from pyo-salpinx is easily

made when the cystic collection of fluid in the tubes is still mobile and pediculated; it is impossible if the cystic tumour has become largely adherent, or if it has become fistulous; it is then only by consideration of the general symptoms and the history that suspicion is roused with regard to the diffusion of the inflammation, but the question can only be definitely settled by laparotomy. Cellulitis of the broad ligament forms a lateral tumour placed on one side or other of the uterus; it appears rapidly after parturition. Pelvic hæmatocele at the commencement gives definite fluctuation; it only occasions febrile symptoms when it suppurates and becomes transformed into a pelvic abscess.

III. *Cellulitis of the broad ligament.*—By foreign writers this condition is generally denominated parametritis, but I think there is every reason to keep the old expression under which it has become, in France, the subject of now classical descriptions, and more especially as the term expresses shortly and with sufficient exactitude the principal, if not the initial, seat of the lesion.

As a rule, it becomes evident about the end of the first week after parturition, when special circumstances have made it septic (during epidemics, or if manipulations have been carried out without sufficient antiseptic precaution, &c.).

A severe rigor may mark the onset, but in other cases local pain may be the initial symptom; the pain has its seat in the lumbar region and radiates into the thigh. Anorexia, loss of sleep, profuse sweats, slight irregular rigors, remittent fever, profound alteration of the features, announce the onset of suppuration; when the pus has formed, a period of relative ease may give the patient a sort of deceptive respite. If a digital examination be made during this time, for the first few days nothing more than a general thickening of the culs-de-sac, with fixation of the uterus and predominance of the swelling on one side, will be found. Later, if an examination be made, and aided by bimanual palpation, the general thickening is felt to have become localised in one lateral mass, united to the uterus, which it binds down to the pelvic wall, and reaching up to the brim of the pelvis as if the broad ligament had become solidified. A crescent-shaped prolongation generally surrounds the cervix, from which it is separated by a furrow. The uterus is pushed

towards the healthy side, and latero-version is often very marked.

At this period resolution may occur, and the disease may end by the absorption of the plastic material and the fibrous retraction of the broad ligament. But this constitutes an infinitely rare exception. Generally, after a short remission, the rigors return accompanied by profuse sweating and diarrhœa, while the rapid and great deterioration of the general health gives a clear idea of a septic infection. Death may now occur. It is more common, however, for the pus to find an outlet for itself unless the surgeon, being forewarned, forestalls the efforts of nature. The purulent infiltration extending further and further towards the limits of the broad ligament passes beyond them towards the vagina and the sides of the pelvis; the vaginal cul-de-sac becomes thickened and indurated, and gives to the examining finger the sensation that has been described as a "cardboard vagina" (vagin de carton). On the other hand, there may appear, internal to the anterior superior spine of the ilium or a little lower, exactly above Scarpa's triangle, and separated from it by the crural arch, an indurated plate-like or plastron-like mass, which is an indication of the invasion of the subcutaneous cellular tissue. By this time the tumour has often exceeded the limits of the pelvis and reached into the iliac fossa. The flat indurated mass extends, softens at its centre, becomes reddened, and the greenish thick pus is discharged in enormous unexpected quantities through an opening that is often very small. In the same way it may be discharged into the vagina, or more rarely into the rectum, the cæcum, or even the bladder. Cases of fatal peritonitis are much more frequently due to extension of the inflammation to the abdominal cavity than to discharge of the pus into it.

The opening may remain fistulous, giving exit to constantly diminishing quantities of pus, and may at length, often after a very long time, close up; patients are frequently carried off during this period by hectic, unless the surgeon intervene and freely open, drain, and disinfect the seat of the constant suppurative process.

The diagnosis can only be doubtful at the commencement when one does not know whether the suppuration will be limited, and form a pelvic abscess, and at the termination, when, having exceeded the pelvic boundaries it has transformed the cellulitis

of the broad ligament into a true abscess of the iliac fossa. An opinion therefore must be formulated upon a consideration of the progress of the disease, which is, in point of fact, very characteristic and cannot be confounded with that of perityphlitis, abscess involving bone, nor even with a rapid cancer of the ilium.

IV. *Diffuse pelvic cellulitis* is only a local manifestation of a general septicæmic state, which of itself sufficiently attracts the practitioner's attention; I shall therefore not lay much stress upon it. I will simply mention the extreme rapidity of its extension, causing it to be compared to erysipelas; the tendency to sloughing of the cellular tissue which may give rise to emphysema; the ulceration of vessels sometimes of sufficient size as to cause formidable hæmorrhage;* and the fatal course of the disease.

Prognosis.—The prognosis varies essentially according to the variety and the degree of the peri-metro-salpingitic inflammation. It is because they have failed to make this distinction that writers differ so widely upon this question of prognosis.

Serous peri-metro-salpingitis shares the prognosis of the tubal lesion upon which it depends. It has a chronic, relapsing course, but does not endanger life, and for a long time remains more of an infirmity than a disease.

Pelvic abscess is more serious; it may be fatal by acute peritonitis, by rapid septicæmia, or by slow hectic. Its course is also capricious and paroxysmal, as Gosselin well pointed out.† But this surgeon, like his contemporaries, manifestly confused. under the name of peri-uterine cellulitis, catarrhal salpingitis with inflammatory œdema and pyo-salpinx.

When the patient has escaped the dangers of the acute stage, and the disease, by absorption or spontaneous evacuation of the inflammatory products, has reached what may be called its natural cure, her health is none the less subject to continual disturbance in consequence of chronic lesions of the tube, abnormal adhesions, retraction of ligaments, displacements of the uterus and ovary, &c. Sänger has expressly noted that the

* Matthews Duncan (Trans. Obst. Soc., Lond., 1887, p. 191) communicated three cases of the opening of large vessels, and even of the iliac vessels, in pelvic cellulitis.

† Gosselin. Clin. de la Charité, vol. 3, p. 56.—Cf., for example, the chapter relating to a case of "hæmorrhagic metritis coinciding with peri-uterine cellulitis," in which the diagnosis of pyo-salpinx with peri-metro-salpingitis is very obvious.

ureters are more easily palpated in women who have been the subjects of peri-uterine inflammation, since their walls have become thickened by the neighbouring inflammatory process. The occurrence of pyelo-nephritis caused by the cicatricial contraction resulting from a pelvic abscess has even been reported.*

Freund† has described under the name of "atrophic or atrophying chronic parametritis" a spontaneous disease which, he says, must not be confounded with the atrophy secondary to a pelvic abscess cured by spontaneous absorption, and the fibrosis occurring in tissues that have been affected by inflammation. Be that as it may, the results may be similar. Under the influence of this retraction the blood-vessels are compressed, and atrophy of the whole generative tract with anticipation of the menopause results. Sänger has remarked that the ureter is easier to feel, larger, and harder on the side on which there had formerly been parametritis; this may be dependent upon the neighbouring inflammation and a kind of secondary parenchymatous ureteritis.

The prognosis of cellulitis of the broad ligament is grave. Death may occur during the inflammatory storm at the commencement, or slowly from lengthened suppuration, or even suddenly from embolism dependent upon thrombosis of the pelvic veins.

Diffuse pelvic cellulitis is almost invariably fatal.

Treatment.—The treatment of serous peri-metro-salpingitis is bound up with that of the salpingitis upon which it depends. It chiefly consists in rest, the exhibition of antiphlogistic remedies, and particularly prolonged injections of hot water. No doubt there are some cases of this kind which have been rapidly cured by electricity.‡

Acute attacks have often been found to cease soon after the

* L. Brown. Pyelitis and an acute suppurative nephritis caused by compression of the ureter from a cicatricial mass, the result of a pelvic abscess (Med. Record, New York, 1889, vol. 1, p. 285).

† W. A. Freund. Versamml. deutscher Naturf. u. Aerzte, Innsbruck (Monatsch. f. Geb., 1869, vol. 34, p. 380); and Gynäk. Klinik. Strasburg, 1885. ("Das Bindegewebe," &c.)

‡ Apostoli. Copenhagen Congress, Aug., 1884, and Bull. gén. de thér., Sept. 30, 1887.—B. M. J., Nov. 19, 1887.—Bröse and Nagel (Berlin Gyn. and Obst. Soc., March 8, 1889, in Centr. f. Gyn., 1889, No. 16, p. 275) have also obtained excellent results. Nevertheless Nagel confesses that he still prefers the simpler and equally efficacious means of hot-water irrigation.

institution of an energetic intra-uterine treatment such as curettage followed by injections, and this result has been adduced as supporting the lymphatic view of peri-metritic disorders.* These incessant exacerbations are not the least indications that have led surgeons to remove the appendages,† a course which not only cures the salpingitis, but also the peri-salpingitis at the same time.

Tumours of acute inflammatory œdema have but little tendency to suppurate, and since they are the most common they have given an impulse amongst medical men to the expectant treatment, and have allowed it to become too common.

I am distinctly adverse to the puncture of these tumours with an idea of evacuating the collection of serum; it may lead to their suppuration, and can scarcely accelerate their resolution.

With regard to the other varieties, pelvic abscess and abscess of the broad ligament, the chief indication is at first to moderate the intensity of the inflammation by the use of prolonged hot-water douches, local letting of blood, &c. Later, when the pus has formed, operative interference will be necessary.

In what region must the collection of pus be opened, and how is it to be opened? I shall examine successively different cases that may call for modifications in the surgeon's method of intervention.

A. *The abscess projects towards the vagina.*—Is puncture with a trocar sufficient? It was recommended by Simpson, and latterly has been reverted to by Tenneson,‡ who performs it in the posterior vaginal cul-de-sac, even in the absence of fluctuation; he resorts to capillary puncture with aspiration for the evacuation of either the serum or the pus of peri-metritis. This course has little to recommend it; it is dangerous, and exposes to the risk of wounding the intestine if the sac be still some distance from the vaginal wall; it is insufficient if the sac be adherent, and at most it might be employed under the last mentioned circumstances, to confirm diagnosis, and as an immediate preliminary to more effectual interference.

Professor Laroyenne§ (of Lyons) also resorts to puncture

* Cantin. Non-puerperal peri-uterine lymphangitis. Thesis, Paris, 1889.

† Korn. Gyn. Soc. of Dresden, March 3, 1887. (Centr. f. Gyn., 1887, p. 451.)

‡ Cf. H. Hervot. Contrib. to the study of perimetritis. Thesis, Paris, 1887.

§ Laroyenne. Lyon méd., Feb. 21, 1886.—E. Blanc. On chronic peri-uterine inflammation, &c. Thesis, Lyons, 1887.—P. Goullioud. French Congress of Surgery, 4th meeting, Paris, 1889, p. 692, and Opening of pelvic abscesses through the vagina (Arch. de tocol., 1891, pp. 562, 700, 788, and 801).

through the vagina in cases of chronic peri-uterine inflammatory masses, where there is hidden collection of pus, serum, or blood.

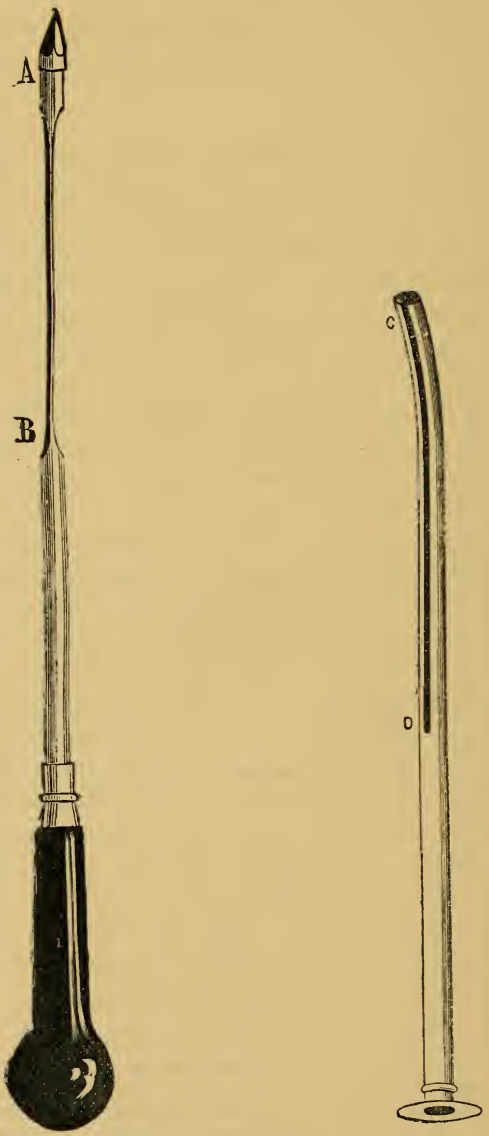

Fig. 330.—Laroyenne

His special trocar, of somewhat large size (equal to an English No. 11 catheter), has a lateral cleft which serves as a directing

groove for the guidance, after puncture, of a lithotome down to the focus of fluid by which the tissues are divided on both sides for from 3 to 5 cm. (fig. 330). A glass tube with olive-shaped extremity serves for the administration of antiseptic douches at a low pressure. By these means he has obtained some successful cases.

I believe that the operation may be simplified, after the presence of pus has been determined by aspiration, by going in search of it and incising layer by layer the posterior vaginal cul-de-sac, while hæmorrhage is kept within bounds by the application of hæmostatic stitches similar to those inserted by Martin in the first stage of vaginal hysterectomy. If the flow of blood be somewhat abundant, temporary plugging will soon overcome it. When the abscess has been opened, a gutta-percha drainage-tube with cross-piece, which easily keeps itself in position, should be inserted, and around it iodoform gauze should be packed. This is very nearly Mundé's method of procedure.* To it he adds a very careful scraping of the abscess cavity with a blunt curette, but this only seems to me to be of any real advantage in exceptional cases (*e.g.*, a dermoid cyst containing hair and other *débris*, which was the starting-point of one of the abscesses opened by Mundé). The treatment is not without its attendant dangers. In point of fact, Laroyenne has shown that the upper wall of a pelvic abscess is generally very friable and may be lacerated by nothing more than a slightly forcible injection.

To avoid wounding the ureters and the uterine or vaginal arteries,† the following rules must be conformed to, in the choice of the site for incision:

The tumour, posterior: transverse or vertical incision, directed according to the chief axis of the tumour.

The tumour, lateral: oblique incision, directed from behind and from without, and not passing beyond the prolongation of the transverse diameter of the cervix in front.

* Mundé. The treatment of pelvic abscess in women by incision and drainage (Amer. Journ. of Obstet., Feb., 1886, vol. 19, p. 113).

† Reeves Jackson (cited by Mundé, *loc. cit.*, p. 119) has reported a case of death from hæmorrhage following upon aspiratory puncture in a case of pelvic abscess.—Clinton Cushing (San Francisco) has suggested the use of an instrument similar to a pair of glove-stretchers, but pointed, so as to introduce a drainage tube by simple puncture and opening of the blades, and thus avoid cutting.

The tumour, anterior: a very small transverse incision combined with a longer antero-posterior incision.

I believe that this incision through the vagina should be reserved for a small number of peculiarly favourable cases, and that as a general method it is infinitely inferior to laparotomy. As a matter of fact, it is only after direct exploration, viz., after opening the belly, that the surgeon can definitely ascertain that the sac cannot be completely removed, and if this can be done the disease will be definitely cured, whereas with incision there is always the cause left behind of incessant relapses.

Lastly, when the vaginal method is chosen, one is never quite certain of not wounding some coil of intestine bound down in Douglas' pouch.

B. *The abscess projects towards the rectum.*—In this case, should the incision be made through the intestine, unfavourable as it is with reference to the ulterior antisepsis of the seat of inflammation? I think not, though my opinion is contrary to that of Byford,* who has spoken in the highest terms of praise of that course. In such a case it would be better to afford an exit to the pus by a para-sacral incision, or by perinæotomy.

C. *The abscess is at equal distances from the vagina and the abdominal wall.*—Various methods have been proposed for reaching it:—

1. Through the perinæum (Hegar, Sänger, O. Zuckerkandl).

2. Through the pelvis or sacrum (E. Zuckerkandl, Wiedow, Sänger).

3. Incision over Poupart's ligament, and raising of the peritoneum until the seat of inflammation is reached (Hegar),† by an operation similar to that for ligature of the iliac artery, and which I have proposed to call "sub-peritoneal laparotomy."

4. By trans-peritoneal incision, or laparotomy properly so-called, as has been recommended by Lawson Tait.‡ This in itself comprises two procedures, according as the abscess-wall is stitched to the abdominal wall, or as it be resected, and the cavity thus reduced in size be drained through the vagina.

5. Incision in two stages.

* Byford (Chicago). Amer. Journ. of Obst., 1886, p. 425.

† Hegar and Kaltenbach. Treatise on Oper. Gynæcology, French trans. by Bar, p. 464.

‡ Lawson Tait. The path. and treat. of the dis. of the ovaries. Birmingham, 1883.

I shall rapidly pass these various methods over in review.

1. *Through the perinæum.*—Hegar * long ago proposed to go in search of pelvic abscesses through the ischio-rectal fossa, by an incision running from the tuberosity of the ischium to the

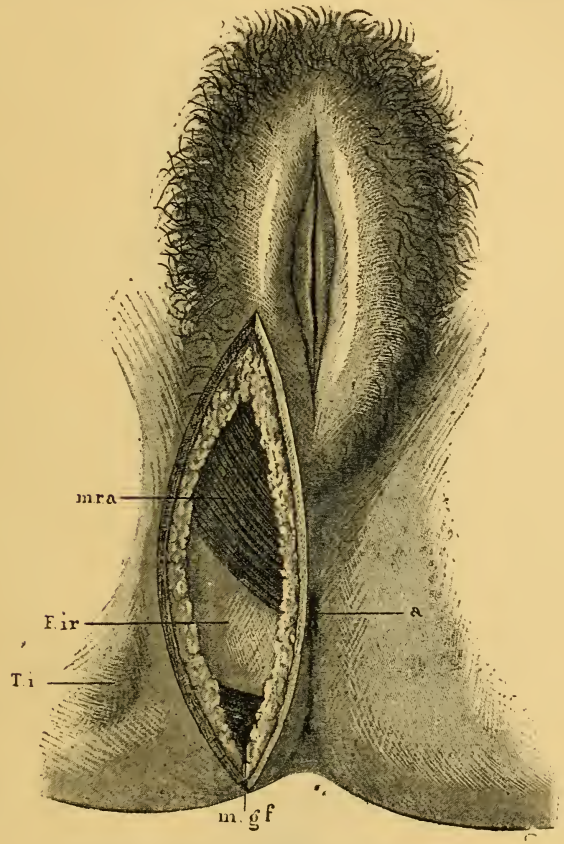

Fig. 331.—Vertical perinæotomy (Hegar, Sänger).

a, anus; T.i., tuberosity of the ischium; m.gf., gluteus maximus; m.r.a., levator ani; F.ir., ischio-rectal fossa.

tip of the coccyx. Vertical perinæotomy, which has been recommended by Sänger,† is only an enlarged Hegar's perinæal incision: it consists of an incision on one side of the median line commencing at the junction of the middle and posterior

* Hegar and Kaltenbach. *Loc. cit.*, p. 464.

† M. Sänger. Arch. f. Gyn., 1890, vol. 37, part 1, p. 100.

thirds of the labium majus and ending 2 cm. beyond the anus, between this orifice and the tuberosity of the ischium; it allows the surgeon to penetrate above the levator ani muscle, after having incised it (fig. 331).

Transverse perinæotomy, according to Otto Zuckerkandl's

Fig. 332.—Transverse perinæotomy (O. Zuckerkandl).

A, anus; R, rectum; V, vagina; M.r.a., levator ani muscle; F.ir, ischio-rectal fossa.

method by separation of the recto-vaginal septum, has been particularly recommended for the extirpation of cancer of the cervix uteri, but has also been pointed out (Sänger) as capable of serving for the evacuation of collections of matter in Douglas'

pouch. The incision reaches from one ischium to the other (fig. 332), and at its two extremities it may be extended for a short distance obliquely from before backwards, and from within outwards, whereby it assumes the shape of a trapezium, the base of which is absent. One can thus penetrate very deeply, even up to Douglas' pouch, and the pus or other material can be evacuated without running nearly so great a chance of infection as if it were evacuated through the rectum. But since the wound is funnel-shaped, the surgeon cannot operate sufficiently at his ease to undertake the removal of a pyo-salpinx by this method.

2. *Through the pelvis or sacrum.**—Various new methods have been proposed for reaching the abscess.

The para-sacral incision of E. Zuckerkandl and Wölfler, by means of a deep incision over the sides of the sacrum, penetrates into the superior pelvi-rectal space, above the levator ani muscle.

Definitive or temporary resection of the coccyx and the sacrum, after Kraske's method, modified by Hegar. But this operation is only useful when much room is necessary, as for the removal of a tumour; an evacuating incision does not require it.

All these methods are ingenious, and may be of service in special cases. But they are all inferior to laparotomy in this respect, that laparotomy alone allows of the formation of a true exploratory incision of such size and in such a position that the surgeon can make out whether he has to deal with a pyo-salpinx that can be enucleated, or with a pelvic abscess that he would only be justified in incising; one therefore runs the risk of simply incising many sacs that could have been removed, and extirpation, if possible, leads to an incomparably more rapid and complete recovery.

3. *Sub-peritoneal laparotomy*† presents the great advantage

* Wiedow. Third Congress of German gynæcologists, Friburg, 1889 (Centr. f. Gyn., 1889, No. 30, p. 520), and Berl. klin. Woch., 1889, No. 18, p. 202.—Sänger. Centr. f. Gyn., 1889, No. 31, p. 542.—S. Saxtorph (of Copenhagen). Hosp. Tid., 1890, pp. 1245, 1265, and 1891, p. 73.

The first case of opening of a pelvic abscess through the sacrum was published by Wiedow (Berl. klin. Woch., March 11, 1889).—He relates at the same time a case of salpingotomy performed in a similar way.

† S. Pozzi. On sub-peritoneal laparotomy, &c. (Bull. et Mém. de la Soc. de Chir., April 14, 1886).—Bardenheuer. Der extra-peritoneale Explorativschnitt, Stuttgart, 1887.

of saving the patient from the risk of escape of the pus into the abdominal cavity. It is infinitely less serious, in such a case, than trans-peritoneal laparotomy, or laparotomy properly so called. But it has the disadvantage of only permitting incision of the seat of suppuration, and not reserving the possibility of removal in cases where the sac is enucleable although adherent. Moreover, I uphold it less strongly now that our knowledge upon the subject of pyo-salpinx has become more precise. It may, nevertheless, be of real advantage in certain definite cases. I shall therefore describe it shortly. In the first place, the exact connections of the abscess must be made out by digital and bimanual examination. Next, an incision 8—10 cm. in length is made 1 cm. above the crural arch, the layers of tissue being separately divided until the sub-peritoneal cellular tissue is reached. The serous membrane is stripped off by the fingers, as in ligature of the external iliac, in the direction of the horizontal ramus of the pubis. The peritoneum is raised and drawn inwards by means of a large retractor, or by the fingers of an assistant, while the operator thrusts his finger deep into the wound and feels for the resistance formed by the abscess. He thus gradually arrives at the base of the broad ligament in the deepest portion of the pelvic cavity. When the seat of suppuration, recognised by its fluctuation, is reached, it is incised, its cavity carefully wiped out, and a drainage tube inserted, the free end of which lies outside the abdomen, or (using a drainage tube with cross piece and Wölfler's forceps) (fig. 48) in the vagina. In the latter case combined examination by the vagina and the internal end of the wound must show that the abscess-cavity is no great distance from the vagina. By this method I have obtained several cures.*

It may happen that the peritoneum cannot be sufficiently stripped off for the abscess to be reached, either because a mistake has been made as to its situation, or because some old inflammation has rendered the peritoneum adherent and friable, and laceration is feared. One may then resort to Hegar's ingenious method—viz., evacuation in two stages, as will be later on described.

4. Incision by laparotomy, properly so called, was first performed by Lawson Tait, and later by many surgeons following

* Cf. the cases contained in Versepuy on peri-metritis and its treatment. Thesis, Paris, 1888.

his example.* The abdomen is opened by a small incision (7 to 10 cm. in length), the fingers are introduced to recognise the tumour; it is evacuated by aspiration; the sac is drawn between the lips of the abdominal wound, is opened, and its walls stitched to the sides of the abdominal wall. It is immediately carefully cleaned out and stuffed with antiseptic gauze, or drained by two large drainage tubes. Many most successful cases, but also some failures, have followed on this treatment. Great difficulties may be encountered. It is not always possible to draw the sac through the abdominal walls,† particularly if it be very closely adherent to the pelvis, or of very small size, or perhaps if it be fixed there after considerable difficulty, it may tear away, and then there is effusion of septic material into the peritoneal cavity. Emmet relates that he has seen Lawson Tait himself desist from the operation because he could not succeed in isolating the sac from the agglutinated coils of intestine that covered it.

If possible, the following is the fashion in which the surgeon should proceed. After having assured himself that enucleation of the sac is impracticable, and in the rare cases in which its walls are clearly distinct, it should be emptied by puncture, opened while the peritoneum is carefully protected, thoroughly cleaned out, and, exploring simultaneously through the abscess cavity and the posterior vaginal cul-de-sac, the possibility of drainage through the vagina should be considered. If it would be found easy, a large trocar, or Wölfler's forceps, should be thrust through the vaginal cul-de-sac, up to the bottom of the abscess cavity, and then the long extremity of a drainage tube with cross-piece can be drawn into the vagina, while the cross-piece itself lies at the bottom of the sac. Nothing now remains further than resection of the largest possible amount of the abscess wall, and exact suture on the abdominal side by over-casting, and a few additional interrupted catgut stitches. In the last place the peritoneum is carefully cleaned up and the abdominal wound completely closed (Martin).

* Lawson Tait, *loc. cit.*—Up to July, 1889, he had thus operated on and cured 38 cases of pelvic abscess. (Edinb. med. Journ., July-Aug., 1889, vol. 35, pp. 1 and 97.) Cf. also Christian Fenger. Chicago Obstet. Soc. (Amer. Journ. of Obstet., 1886, vol. 19, p. 428).—MacKay, Lancet, Feb. 12, 1887.—Terrillon. Bull. et Mém. de la Soc. de Chir., June 1, 1887, p. 367.

† Wiedow. *Loc. cit.*

If the abscess wall does not form a distinct sac, lending itself to the adoption of the above mentioned course, the surgeon must content himself with cleaning it out thoroughly, and filling it with iodoform-gauze, as in the method of antiseptic plugging of the peritoneum, already described.*

5. Lastly, Hegar† has proposed to deliberately open the abscess in two stages, as Volkmann has done in the case of hydatid cysts of the liver. At the first stage the belly is opened, and plugged with iodoform gauze in such a manner as to form a canal between the sac and the abdominal incision. The second stage, four or five days later, consists in incising the sac when the adhesions have become sufficiently firm. This method may also be adopted per vaginam.

D. *The abscess is closest to the abdominal wall.*—The surgeon must in this case go in search of the pus through an incision made immediately below Poupart's ligament, and, if necessary, strip off the peritoneum for a short extent. It may be remarked in passing that even if a button-hole opening be made in the serous membrane, it is of but little importance so long as the purulent sac be large and close to the integument, for the intra-abdominal pressure forces the sac between the edges of the incision and keeps it there, so that there is scarcely any possibility of the escape of the pus into the peritoneal cavity.

Confusion must not be made between sub-peritoneal laparotomy and the incision of a collection of pus situated in the iliac fossa, accompanied by very limited stripping off of the serous membrane, but without the necessity of searching for it deeply down in the pelvic cavity. Certain writers have made this confusion.‡

* S. Pozzi, de Lostalot-Bachoué, and Baudron. Clinical and operative remarks on thirty cases of laparotomy. (Annal. de Gyn., May, 1890, vol. 33, p. 251 and foll.)

† Wiedow. Zur operativen Behandlung der Pyo-salpinx (Centr. f. Gyn., 1885, No. 10, p. 145) and Third Congress of German gynæcologists, Friburg, 1889 (Centr. f. Gyn., 1889, No. 30, p. 520).

‡ Houzel (of Boulogne). Bull. et Mém. de la Soc. de chir., 1887, p. 856.—The word "laparotomy" (λαπάρα, the flank, and τόμη, a cutting), used alone, ought to keep the signification that custom has given it, and should mean incision of the whole of the abdominal wall, including the peritoneum. One of the essential features of laparotomy is that it is always more or less exploratory; for, however certain the diagnosis may be, there are many particulars that can only be made out after the belly has been opened. It is this exploratory character that is also found in incision of the abdominal wall without opening of the peritoneum, but with insinuation of the fingers beneath it, and it seems to me that this character makes it

The incision into a large collection of pus, such as is generally formed by cellulitis of the broad ligament, must be sufficiently extensive (6 to 8 cm.) and should be kept open by the insertion of two large drainage tubes united like the barrels of a double-barrelled gun, and gently thrust down to the bottom of the abscess cavity. They may be replaced by a thick strip of iodoform gauze. If injections be given they should be of some weak antiseptic fluid (1 per cent. carbolic acid or 1 in 5,000 sublimate), and they should always be followed by the injection of filtered and boiled water, so as to avoid the risk of allowing a liquid, absorption of which might give rise to toxic effects, to remain in the large cavity. If, in spite of this precaution, stagnation occur, the diverticula of the sac might be plugged with iodoform gauze. Lastly, if the sac extends at its lower end fairly close to the posterior vaginal cul-de-sac, which would be recognised by local examination bimanually, it should also be drained into the vagina. But the greatest precautions must then be taken not to wound the bladder, and to direct the point of the Wölfler forceps or the large Chassaignac trocar with the finger, right down to the vaginal cul-de-sac, proceeding from above downwards, and keeping the fingers of the other hand ready to receive it in the vagina. Mundé* has twice had the misfortune of causing this accident, though in point of fact it was no followed by serious consequences.

E. *The abscess has infiltrated the pelvic roof.*—The abscess forms a kind of purulent sponge, the meshwork of which is composed of the thickened connective tissue and firm false membranes. In these cases the uterus and appendages are incarcerated and cemented like bricks in a wall by the inflammatory products. Under these circumstances, interference by laparotomy is particularly serious, and nothing more should be undertaken than opening of the abscess, plugging the cavity, and providing ample drainage through the abdominal wall, and also into the vagina by means of a counter-opening made in Douglas' pouch. Recovery is always slow and difficult, and induration and fistulæ persist for a long time. Nevertheless, in this way I have

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sufficiently analogous to a complete laparotomy to allow of its receiving the same generic name, though with the addition of the specific and restricting qualification of sub-peritoneal."

* Mundé. Amer. Journ. of Obst., 1886, vol. 19, p. 113. (Observ. 6 and 9.)

obtained some remarkable recoveries,* and Bouilly† has also reported similar successes.

Vaginal hysterectomy was first proposed by Péan for these cases, but he later generalised it for all bilateral inflammatory lesions of the appendages. This extension of the operation seems to me to be excessive; but limited to very definite cases of diffuse suppuration, vaginal hysterectomy is sometimes superior to laparotomy, or to simple incision of the posterior vaginal cul-de-sac, recommended by Laroyenne. An important point is the difficulty of forming an exact diagnosis between the lesions I have just described, and pyo-salpinx moderately adherent, but capable of enucleation, and surrounded by a zone of serous infiltration. To make this diagnosis, an immense amount of experience is necessary, and even then one can only speak with a comparative amount of certainty. I have often commenced laparotomy without the slightest hope of being able to remove the purulent sac, and with the idea of opening and disinfecting it by plugging with iodoform gauze, but nevertheless have succeeded without great difficulty in shelling out the wall of the abscess formed by the ovary and tube.

Now, to my mind, this complete extirpation of the seat of suppuration is a much better guarantee for a complete and permanent recovery. I therefore hold that the indications for vaginal hysterectomy in pelvic suppuration should be confined to very narrow limits, and that the operation should be restricted to cases in which extirpation of the lesion is manifestly impossible. Its great advantage is that it avoids the laborious task of detaching the coils of intestines, and of searching for collections of pus disseminated through the inflammatory mass that fills the pelvic cavity.

No doubt hysterectomy is, under these circumstances, far from being an easy operation, as certain of its enthusiastic supporters have asserted after too short an acquaintance with it. The uterus is immovable, cannot be lowered in the least, while all around it is a thickened friable and very vascular mass of tissues. An extreme degree of operative skill is necessary to liberate the organ when it is thus incarcerated, but when this

* S. Pozzi, de Lostalot, and Baudron. Annal. de Gyn., 1890, vol. 33, p. 252.—S. Pozzi and Baudron. Rev. de chir., Aug., 1891, p. 622.

† Bouilly. Bull. et Mém. de la Soc. de Chir., 1890, p. 520.

object is attained, one often finds that one has not encroached upon the peritoneal cavity, which is shut off on all sides by inflammatory products, insomuch that the fundus of the uterus is encased in this firm mass, much in the same way as the kernel is enclosed within a nut-shell. To bring this fact well into relief, I have therefore said that "hysterectomy is only indicated when it will be very difficult to perform." But once it has been carried out in these complicated cases, it puts the patient in the best possible condition for recovery. A large hole is thereby made right in the midst of the inflammatory mass, consisting of plastic material and pus, and allows of ample drainage, the efficacy of which is assured by the declivity. One can also, by this loss of substance, carry antiseptics, in the shape of iodoform tampons and injections, right into the midst of the "purulent sponge," the meshwork of which has often been freely opened up by the operation. I think there is no advantage and much risk, after removal of the uterus, in going in search of collections of pus. In the somewhat frequent cases in which they have not been evacuated at the outset, the practice recommended by P. Segond, which consists in searching for fluctuating points and breaking them open with the fingers deeply introduced into the vagina, seems to me to present more disadvantages than advantages.

I do not approve of Segond's suggestion unless the collection of pus can be easily recognised by combined bimanual and digital examination. As a matter of fact, if one determine upon making a thorough search for pus, one runs a great chance of deranging the forceps that are controlling the hæmorrhage, of carrying infection from the outside, and even of wounding tense coils of intestine, the nature of which might be mistaken. After extirpation of the uterus, which, to my mind, is the fundamental and not a preliminary (Reclus) operation, I recommend as the general rule no further interference beyond plugging the site formerly occupied by the uterus with a bag of iodoform gauze filled with strips of gauze, after the manner of Miculicz's operation for plugging the peritoneum, and trusting to spontaneous rupture for the evacuation of the foci of suppuration that were not easily accessible.

The method of performing vaginal hysterectomy, practised for the cure of peri-uterine suppuration (which for this reason I propose to call "evacuatory") was first of all described by Péan.

The uterus, then always more or less fixed by adhesions, can only be removed by piecemeal extraction. I shall not discuss here, as in the case of hysterectomy for cancer, the comparative advantages of ligature and forcipressure ; the latter alone is here possible.

Before describing the operation itself, I must mention the

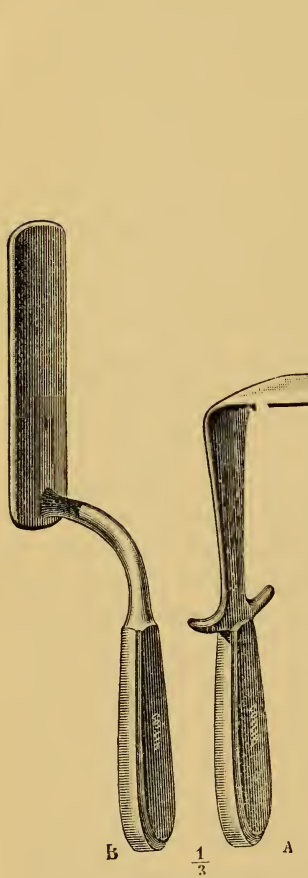

Fig. 333.—Péan's retracteurs (Collin).

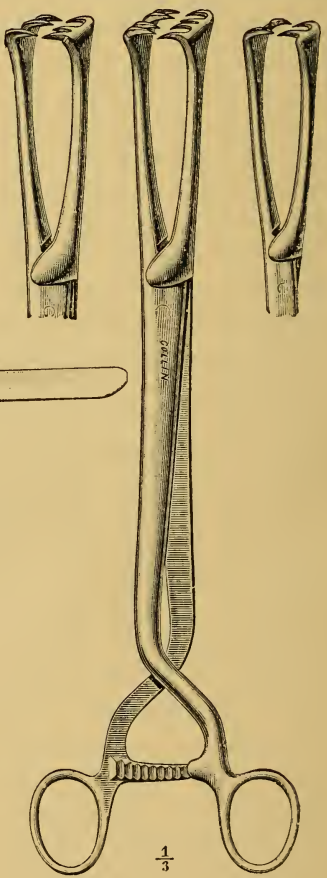

Fig. 334.—Forceps for piecemeal extraction (Collin).

important part that is played by the long retractors used by Péan (fig. 333) to keep the field of operation well in view, and to secure, by compression, temporary arrest of hæmorrhage. The surgeon must also have at hand some very strong toothed forceps

(fig. 334), which are indispensable for piecemeal removal of the uterus. Lastly, he should be provided with forceps having short parallel teeth (fig. 47) for forcipressure of the broad ligaments. I repeat, the application of ligatures is here not to be thought of,

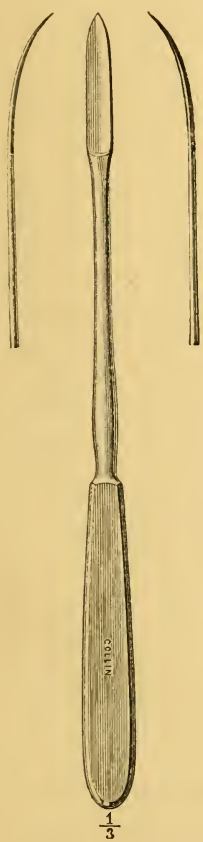

Fig. 335.—Long curved and straight bistouries (Collin).

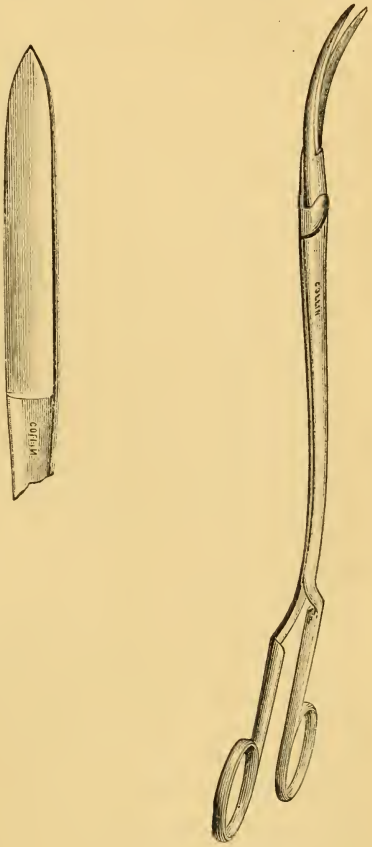

Fig. 336.—Long curved scissors (Collin).

on account of the depth at which one is operating in consequence of the immobility of the uterus.

*Method of performing evacuatory vaginal hysterectomy.**—The patient being placed either on the left side or in the dorsal

* Part of the following description is borrowed almost word for word from P. Segond. On vaginal hysterectomy in the treatment of pelvic suppuration. Paris, 1889, pp. 24 to 26.

decubitus, the vulva is kept widely open by bent retractors, and a good grasp taken on the cervix by means of lowering forceps. This done, the vaginal mucous membrane is incised all round the cervix, which is liberated as high as possible; piecemeal removal is then proceeded with. This is carried out in successive stages, and each stage comprises four principal manœuvres, viz.: 1. Liberation of the anterior and posterior surfaces of the uterus; 2. Section of the broad ligaments; 3. Division into two flaps of the portion of the uterus freed by the two preceding manœuvres; and 4. Removal of the two flaps thus obtained.

Liberation of the anterior and posterior surfaces of the uterus should be carried out as close as possible to the uterine surface by means of the blunt end of a long Péan's retractor, which must be carefully used, and constant watch must be kept that the instrument is not removed from contact with the uterine tissue. In this way injury to the bladder and rectum will be avoided, and according to circumstances either the peritoneal cul-de-sac or a collection of pus will be opened up. The uterus may happen to be liberated completely without either the peritoneum or the smallest collection of pus being opened, and then the uterus is, so to speak, enucleated from the plastic material that surrounds it. The above are eventualities the surgeon must be quite prepared to meet.

The broad ligaments are to be divided according to the following rules: the two retractors that have been placed against the anterior and posterior surfaces of the uterus, either by sub-peritoneal breaking-down of adhesions or by breaking open collections of pus in apposition with the uterus, or, once more, by penetration into the peritoneum, are left *in situ* for the protection of the bladder and rectum. With forceps having parallel teeth that portion of the broad ligaments corresponding to the freed portion of the uterus and rendered visible by the retractors is seized and divided close to the uterus.

The two final stages of the operation are as follows: the segment of the uterus freed by the partial section of the broad ligaments is divided into two flaps, which are successively removed, after taking care to lay hold of the base of each with two pairs of lowering forceps. The first portion of the uterus is thus removed, and the same method being carried out with the remainder of the body of the uterus, by degrees the surgeon

removes the whole organ without any great loss of blood and with every manœuvre under the control of his eye. Exceptionally, he may be forced to leave at the bottom of the wound the highest portions of the organ, but according to all accounts this does not appear to cause any grave inconvenience with reference to the therapeutic result of the operation. As a matter of fact, for it to be effective the opening up of a free exit for the pus is all that is necessary.

The operation ended, the whole of the resulting wound is carefully cleaned with aseptic sponges borne on holders and thrust into its inmost recesses. I must here mention that vaginal hysterectomy is the only operation for which I now use sterilised sponges.* In point of fact, they cannot well be replaced by cotton-wool plugs, the absorbent power of which is much inferior, and the compresses that I use in laparotomy are, under the circumstances, not sufficiently convenient to manage.

Drainage is provided for by the introduction into the large cavity left by the removal of the uterus of a bag made of iodoform gauze filled with strips of the same material. This bag is placed between the forcipressure forceps that are keeping the bleeding in check. To prevent these forceps from injuring the vaginal walls thick layers of iodoform gauze are placed between them and the walls. Then the forceps are collected into a bunch and the whole surrounded by absorbent cotton-wool, and a gum-elastic catheter is placed in the bladder, to remain there until vaginal plugging is discontinued.

The forceps should be removed after 48 hours, and the tampons on the third day; afterwards irrigations of 1 in 2,000 sublimate are to be given night and morning, but care must be taken not to insert the canula further than the entrance of the vagina, to keep up only a very gentle pressure, and to keep the vagina wide open by placing two fingers in the vagina and depressing the fourchette. These cleansing injections are necessary by reason of the sloughing of the portions of tissue injured by the forceps; but it would nevertheless be dangerous to direct the antiseptic fluid with any degree of force into the midst of the field of operation.

* For the preparation of aseptic sponges, cf. F. Terrier. Bull. et Mém. Soc. de Chir., 1886, p. 929 (prepared by means of hydrochloric and sulphurous acids, and permanganate of potassium, &c.).

Quénu* has proposed to divide the uterus into two portions by an antero-posterior incision. Terrillon tears the broad ligaments, and at the end of the operation leaves only one or two pairs of forceps *in situ*. I shall not dilate upon these modifications.†

The residues of old peri-salpingitis, false membranes, adhesions, &c., give rise to complex painful phenomena, by their pressure upon the ovary and tube, by the mal-positions of the uterus to which they lead, by the agglutination of adjacent coils of intestine, by adhesion of the omentum to the pubis, by compression of the ureters, &c. It is in these cases particularly that massage is indicated to favour the absorption of the plastic products. When the predominating symptom is pain, and pain of a neuralgic character, faradaic electricity may be of use.‡

It has been proposed, as I have pointed out above when considering the treatment of salpingitis, to perform laparotomy with the sole object of liberating the compressed or prolapsed organs by destroying the adhesions that bind them down without removing the uterine appendages. The good results thus obtained, though they do not prove the absolute efficacy of these incomplete operations, which have too often served as the excuse for mistakes in diagnosis, at any rate show the considerable share that must be attributed to this pathological condition in the interpretation of the morbid symptoms.§

Another distant result of inflammation about the uterine appendages is modification of the resistance of the broad ligaments, the round ligaments, and the sacro-uterine ligaments. Our information on this subject is very limited, and the deductions drawn from these undoubted lesions are more theoretical than demonstrated. But it is none the less certain that uterine displacement must be very frequently attributed to relaxation or

* Quénu. Bull. et Mém. Soc. de chir., 1891, p. 640.—O. Terrillon, ibid., p. 612.

† A means which I have found useful whereby to distinguish between the various forceps, and prevent the possibility of pulling a pair of forcipressure forceps under the idea that they are prehension forceps, is to leave the former simply nickeled, and gild the two rings of the prehension forceps. The sponge-holders may be distinguished by a single gold band.

‡ Brüse (Centr. f. Gyn., 1889, No. 42, p. 737) recommends the use of reels of fine and very long wire threads. Out of 25 cases of painful oophoritis and peri-oophoritis he thereby obtained 21 permanent cures and 2 ameliorations.

§ Polk. Are the tubes and the ovaries to be sacrificed in all cases of salpingitis? (Amer. Gynæc. Soc., Sept. 3, 1887, in Amer. Journ. of Obstet., October, 1887, vol. 20, p. 1045.)

retraction of ligaments, in consequence of a former inflammatory condition. I particularly mention that retraction of the broad ligament so frequently observed in cases of deep laceration of the cervix on the same side, which produces a certain degree of lateral deviation of the uterus by means of a true chronic parametritis. The latter may perhaps be only a chronic peri-lymphangitis, a thickening of the connective tissue of the broad ligament around the numerous lymphatic trunks that course through its base on their way from the cervix to the iliac glands (figs. 313 and 314). In this case also massage may be of great service.

It was in consequence of a similarity of name, that to my mind suggests a false analogy of lesion, that I was obliged, in the chapter on parametritis, to speak of the condition described by Freund* under the name of atrophy-producing or atrophic chronic parametritis. In young women one occasionally finds the sexual organs as reduced in size as if they had long passed the menopause; the broad ligaments are retracted and hard. It would therefore be a kind of extension of the uterine atrophy passing the limits of the organ itself and attacking the parts in its immediate neighbourhood. As treatment Freund recommends warm douches and massage.†

* Freund. Monatschr. f. Geb., 1869, vol. 34, p. 380, and Verhandl. der Rostock. Natur-forschers., 1871, p. 63.

† The following are a few indications on the method of performing massage of the internal generative organs that I take from a paper by Vulliet (Massage in gynæcology. Paris, 1890, p. 10). External massage of the abdominal walls is only a preparatory manœuvre, a massage to ensure suppleness. It is the mixed or abdomino-vaginal massage that is generally performed. Whatever be the initial rigidity of the abdominal and vaginal walls, there is one space where the hands can always meet. It is in the supra-pubic region, immediately behind the symphysis. The external hand is placed on the mons veneris with the fingers directed towards the umbilicus. The first and second fingers of the other hand are inserted into the vagina, together if it is sufficiently capacious, successively if it is narrow. Once the two fingers are inserted, they are placed with the palmar surface towards the vesico-vaginal wall, the dorsal surface towards the perinæum. The anterior commissure is thus out of the reach of the movements that are about to be executed. The movements (friction, pressure, relaxation) must always be slow and sustained. The abdominal hand presses the tissues directly downwards from above, and the vaginal hand pushes them from below upwards. Generally the mistake is made of depressing too much with the abdominal hand, and not exerting sufficient upward pressure with the hand in the vagina. Each of them ought to do part of the work. Immediately behind the symphysis the hands are only separated by the walls that they are pressing against and the bladder; a little further back the uterus, if it is in its normal position, is interposed between them. Anteversion is the position that lends

itself best to massage of the uterus, and it is that in which it is necessary to bring about its reposition.

In chronic metritis and in all the other affections, excepting new growths, which have determined hypertrophy of the uterus, the following is the fashion in which one should proceed. Once the organ has been directed forwards, the fingers that are in the vagina support and fix it, while the external hand practises a series of friction-movements over its posterior surface; then an endeavour is made to get the fundus between the fingers and compress it concentrically, as in the obstetrical manipulation for expressing the placenta.

If there be infiltration of the peri-cervical cellular tissue, it is the external hand that fixes and lowers the uterus, while slow and gentle passes are made around the cervix by the fingers of the other hand. To masse the edge of the uterus the two hands, after being united on the side of the organ, press it away laterally, whereby the lateral portion comes more into the middle line and therefore more accessible. Adhesions are generally found on the antero-lateral portions uniting one of the sides of the uterus with the pelvic peritoneum on the same side. They become stretched when the uterus is drawn or pushed in the opposite direction. By means of communicated movements, their point of attachment may be made out without difficulty. The massage will consist in relaxing the parts where the adhesions exist, to aid their absorption, and in movements impressed on the uterus with the object of freeing it from their restraint.

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